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UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION

IN RE APACHE CORP. SECURITIES LITIGATION	Case No. 4:21-cv-00575

EXPERT REPORT

OF

LUCY P. ALLEN

June 16, 2023

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I. Scope of Assignment

1. I have been asked by counsel for Defendants to analyze whether there is price impact from the alleged misrepresentations that Plaintiffs claim inflated the stock price of Apache Corporation ("Apache" or the "Company"). In particular, I have been asked to focus my analysis on the time period between February 23, 2018 and March 13, 2020 (the "Focus Period") and analyze whether there is a link between any of the alleged misrepresentations made during the alleged "Class Period" (the period between September 7, 2016 and March 13, 2020) and Apache's stock price during the Focus Period. As part of this analysis, I was asked to analyze each of the three alleged corrective disclosures during the Focus Period, i) April 23, 2019, ii) October 25, 2019, and iii) March 16, 2020, and whether there is any link to any of the alleged misrepresentations. For the purpose of this report, I have been asked to assume Plaintiffs' claim of market efficiency.

II. Summary of Findings

2. Plaintiffs allege that Apache made misstatements about its Alpine High resource play that allegedly impacted and inflated the Company's stock price during the alleged Class Period. In general, Plaintiffs allege that Apache "touted Alpine High" as a "transformational discovery" and concealed that "the Alpine High area was 'too gassy' to ever be viable – i.e., too heavy on unprofitable 'dry' gas and too light on valuable oil and 'wet' gas."[1]

3. I find that there is no price impact and no link between any of the alleged misrepresentations made during the alleged Class Period and Apache's stock price during the Focus Period.

4. A detailed analysis of each of the alleged partial corrective disclosures Plaintiffs claim were made during the Focus Period shows no price impact and no link to any of the alleged misrepresentations made during the alleged Class Period:

a) <u>April 23, 2019 alleged corrective disclosure:</u> The announcement of a temporary deferral of natural gas production at Alpine High did not result in a statistically

[1] Consolidated Class Action Complaint, filed December 17, 2021, ¶¶1-8.

significant price decline. The deferral, rather than having any link to the alleged misrepresentations made during the alleged Class Period and Alpine High's reserves or the mix of oil and wet gas vs. dry gas, was expected by the market given the then "extremely" low gas prices.

b) October 25, 2019 alleged corrective disclosure: The price decline following the resignation of Steven Keenan, Apache's Senior Vice President of Worldwide Exploration, was not related to Alpine High, which shows there is no link between this alleged corrective disclosure and any of the alleged misrepresentations. Instead, analysts explicitly attributed the price decline to market concerns about Apache's Suriname exploration. In addition, no new information about Alpine High was revealed on this date.

c) March 16, 2020 alleged corrective disclosure: The March 16, 2020 alleged corrective disclosure was in a *Seeking Alpha* article that no analyst or news story mentioned, let alone tied to any price drop. In addition, there was no new news about Alpine High (or about Apache) within the *Seeking Alpha* article.

5. I find that the lack of a link between the alleged misrepresentations and Apache's stock price during the Focus Period is further demonstrated by the fact that no new information was disclosed and the market did not change its view about Alpine High's oil and wet gas reserves or the mix during the Focus Period. Analysts' estimates of the quantity of oil and wet gas reserves at Alpine High and the reserve mix were essentially unchanged during the Focus Period and a systematic review of commentary of analyst reports issued during the Focus Period found no analyst discussion regarding any change in their view about the quantity or mix of Alpine High's reserves. Instead, analysts repeatedly characterized Alpine High as a *gas-weighted, NGL-rich* play during the Focus Period.

6. Contrary to Plaintiffs' claim that the alleged corrective disclosures during the Focus Period caused Apache's stock price to decline, Apache's stock price moved in-line with the oil and gas exploration and production industry during the Focus Period. Moreover, during this period, the downward changes in expectations about Alpine High were not driven by Alpine High's alleged lack of oil and wet gas reserves or the mix of oil and wet gas vs. dry gas. Instead, they were driven by the deteriorating outlook for commodity prices, particularly the weakening

Waha Hub natural gas prices and natural gas liquid prices. Further, strong evidence that there is no price impact and no link between the alleged misrepresentations and Apache's stock price during the Focus Period is the fact that when commodity prices recovered *after* the Focus Period ended, Apache resumed its previously curtailed production and drilling at Alpine High. Therefore, movements in Apache's stock price and changes in expectations about Alpine High during the Focus Period were not in relation to any new understanding of the reserves or reserve mix at Alpine High, but were due to changes in commodity prices during the Focus Period.

III. Qualifications and Remuneration

A. Qualifications

7. I am a Senior Managing Director of NERA Economic Consulting ("NERA") and a member of NERA's Securities and Finance Practice. NERA provides practical economic advice related to highly complex business and legal issues arising from competition, regulation, public policy, strategy, finance, and litigation. NERA was established in 1961 and now employs approximately 500 people in more than 20 offices worldwide. NERA's Securities and Finance Practice, which performs research in securities and financial markets, dates from the early 1970s and employs a research staff of more than 100 professionals holding degrees in economics, finance, and mathematics. The practice group counts among its clients major securities exchanges, risk managers, principals needing valuation services, and parties in litigation.

8. I have an A.B. from Stanford University, an M.B.A. with a concentration in Finance and Accounting from Yale University, and M.A. and M. Phil. degrees in Economics, also from Yale University. Prior to joining NERA, I was an Economist for both President George H. W. Bush's and President Bill Clinton's Council of Economic Advisers, providing economic analysis on regulation and health care policy issues. In my over 25 years at NERA, I have been engaged as an economic consultant or expert witness in numerous projects involving securities and financial economics. In the course of this work, I have analyzed the effect of information on stock prices of over 100 companies. My resume with recent publications and testifying experience is included as Appendix A.

B. Remuneration

9. NERA is being compensated for time spent by me and my team at standard billing rates and for out-of-pocket expenses at cost. NERA currently bills for my time at $1,150 per hour. NERA's fees are not in any way contingent upon the outcome of this matter.

IV. Materials Considered

10. In preparing this report, I considered the following categories of materials (a complete list of materials considered is included as Appendix B):

a) Consolidated Class Action Complaint, filed December 17, 2021 ("Complaint");

b) Memorandum and Recommendation on Motion to Dismiss, filed September 15, 2022;

c) Order Adopting Magistrate Judge's Memorandum and Recommendation, filed November 29, 2022;

d) Lead Plaintiffs' Motion for Class Certification and Appointment of Class Representatives and Class Counsel and Supporting Memorandum of Law, filed April 7, 2023 ("Plaintiffs' Motion for Class Certification");

e) Deposition of David Sullivan (former Executive Director at Co-Lead Plaintiff Plymouth County Retirement System), dated May 25, 2023 ("Sullivan Deposition");

f) Deposition of Jay Smith (Fund Administrator at Co-Lead Plaintiff Trustees of the Teamsters Union No. 142 Pension Fund), dated June 6, 2023;

g) Expert Report of Zachary Nye, Ph.D., dated April 7, 2023, including exhibits, appendices, and materials considered and turned over ("Nye Report");

h) Apache's filings with the Securities and Exchange Commission ("SEC") between 2016 and 2023;

i) Apache's press releases, presentations, and conference call transcripts from 2016 to 2023, from Factiva and FactSet Research Systems, Inc.;

j) Analyst reports on Apache from Refinitiv Eikon, Dr. Nye's turnover, and the Company;

k) Analyst reports and SEC filings on other exploration and production ("E&P") companies;

l) News stories on Apache, other E&P companies, and the oil and gas industry from Factiva, Google, and Bloomberg;

m) Financial data from Bloomberg, L.P., FactSet Research Systems, Inc., and Federal Reserve Bank of St. Louis ("FRED");

n) Documents on Lead Plaintiffs' trading;

o) Legal decisions on class certification; and

p) Academic literature and textbooks on finance, securities, valuation, and statistics.

V. Background

A. Company background

11. Apache is an energy company headquartered in Houston, Texas that explores and produces crude oil, natural gas, and natural gas liquids ("NGLs"). During the Focus Period, Apache had operations in three primary geographic areas: the U.S., Egypt, and the North Sea (offshore the U.K.).[2]

12. The table below shows Apache's production revenue by product from 2018 to 2020. As shown in the table, approximately 80% of Apache's production revenue was from oil.

[2] Apache FY18 Form 10-K, filed March 1, 2019, p. 1.

Apache Annual Production Revenue by Product

Product	2018	2019	2020
Oil	$5,846M	$5,230M	$3,106M
	80%	*83%*	*77%*
Natural Gas	$919M	$678M	$598M
	13%	*11%*	*15%*
NGL	$583M	$407M	$333M
	8%	*6%*	*8%*
Total	**$7,348M**	**$6,315M**	**$4,037M**

Source: Apache FY20 Form 10-K, filed February 26, 2021.

13. The table below shows Apache's production revenue by region from 2018 to 2020. As shown in the table, the shares of Apache's production revenue from the U.S., Egypt, and the North Sea were stable at around 45%, 35%, and 20% respectively.

Apache Annual Production Revenue by Region

Region	2018	2019	2020
United States	$3,279M	$2,763M	$1,764M
	45%	*44%*	*44%*
Egypt	$2,748M	$2,276M	$1,390M
	37%	*36%*	*34%*
North Sea	$1,321M	$1,276M	$883M
	18%	*20%*	*22%*
Total	**$7,348M**	**$6,315M**	**$4,037M**

Source: Apache FY20 Form 10-K, filed February 26, 2021.

14. During the Focus Period, Apache was engaged, among other activities, in exploration in Suriname and the development of its Alpine High resource play in the Delaware

Basin, primarily in Reeves County, Texas.[3] The Delaware Basin is a sub-basin of the Permian region in west Texas and New Mexico, where Apache had many operations throughout the Focus Period.[4]

B. Summary of allegations

15. Plaintiffs allege that Apache made misrepresentations about the Alpine High resource play that impacted and inflated the Company's stock price during the alleged Class Period.[5] In general, Plaintiffs allege that Apache "touted Alpine High as a 'transformational discovery' and 'world class resource play' with immense production capabilities," and concealed that "the Alpine High area was 'too gassy' to ever be viable – i.e., too heavy on unprofitable 'dry' gas and too light on valuable oil and 'wet' gas."[6]

16. According to the Complaint, Apache made 41 alleged misrepresentations on 34 dates during the alleged Class Period (note two alleged misrepresentations could occur on different dates but have the same market reaction date if one occurs after market hours the previous day and the other during market hours the next day), including 15 alleged misrepresentations on 15 dates during the Focus Period. For the rest of this report, I refer to alleged misrepresentations that have the same reaction date as one alleged misrepresentation. The alleged misrepresentations, which are in most instances short excerpts of lengthy SEC filings, press releases or conference call transcripts, are listed in Appendix C.

17. Plaintiffs claim that "facts that partially corrected" the alleged misrepresentations were disclosed to the market through a series of five "partial" alleged "corrective disclosures"

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3 Apache FY18 Form 10-K, filed March 1, 2019, pp. 3-4.

A play is an "area in which hydrocarbon accumulations of prospects of a given type occur." See, "Play," *Schlumberger's Energy Glossary*, accessed at: https://glossary.slb.com/en/terms/p/play.

4 See, for example, Apache FY18 Form 10-K, filed March 1, 2019, pp. 1, 3.

5 Complaint, p. 1 and ¶¶1-8.

6 Complaint, ¶¶1, 4.

Dry gas is essentially made up of methane, while wet gas also contains natural gas liquids like ethane and butane. See, for example, "What's the Difference Between Wet and Dry Natural Gas," *StateImpact Pennsylvania*, accessed at: https://stateimpact.npr.org/pennsylvania/tag/natural-gas-prices/ and "High value of liquids drives U.S. producers to target wet natural gas resources," *U.S. Energy Information Administration*, May 8, 2014.

during the alleged Class Period, including three dates during the Focus Period.[7] Plaintiffs claim that these alleged corrective disclosures removed alleged inflation in Apache's stock price and caused the stock price to decline.[8]

18. The alleged corrective disclosures are described below:

Alleged corrective disclosures <u>before</u> the Focus Period

1) <u>October 9, 2017:</u> On this date, after market close, Apache held a conference call to provide an update on progress at Alpine High. According to Plaintiffs, Apache allegedly revealed that it was "experiencing significant problems extracting oil from the Woodford and Barnett formations within Alpine High," and that the Alpine High play was "more weighted toward wet gas and dry gas, and that the much more profitable and desirable oil play Defendants had touted was merely 'emerging.'"[9]

2) <u>February 22, 2018:</u> On this date, during market hours, Apache issued a press release and held a conference call discussing the Company's financial results for 4Q17 and FY17. According to Plaintiffs, Apache allegedly revealed "disappointing 2018 production growth guidance, […] lackluster production outlook and longer-than-expected ramp up" for Alpine High for 2019 and 2020. Plaintiffs claim that Apache "disclosed a disappointing gas/oil mix at Alpine High" of 83% gas, 10% natural gas liquids, and 7% oil.[10]

Alleged corrective disclosures <u>during</u> the Focus Period

3) <u>April 23, 2019:</u> On this date, before market open, Apache issued a press release titled "Temporary Deferral of Alpine High Natural Gas Production." According to Plaintiffs, the news that "the Company was scaling back natural gas production efforts," caused Apache's stock price to drop.[11]

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7 Complaint, ¶¶303, 319.

8 Complaint, ¶¶318-319.

9 Complaint, ¶304.

10 Complaint, ¶307.

11 Complaint, ¶¶310-311.

4) October 25, 2019: On this date, during market hours, "media reports revealed that [Steve] Keenan [Apache Senior Vice President of Worldwide Exploration] had abruptly 'resigned.'" According to Plaintiffs, analysts and the media "easily connected news of Keenan's departure to the Alpine High debacle."[12]

5) March 16, 2020: On this date, according to Plaintiffs, a *Seeking Alpha* article was published before market open that disclosed how Alpine High had left Apache "particularly challenged amongst its E&P peers" with high levels of debt.[13]

19. The chart below shows Apache's stock price and trading volume during the alleged Class Period, along with the alleged misrepresentations and the alleged corrective disclosures.

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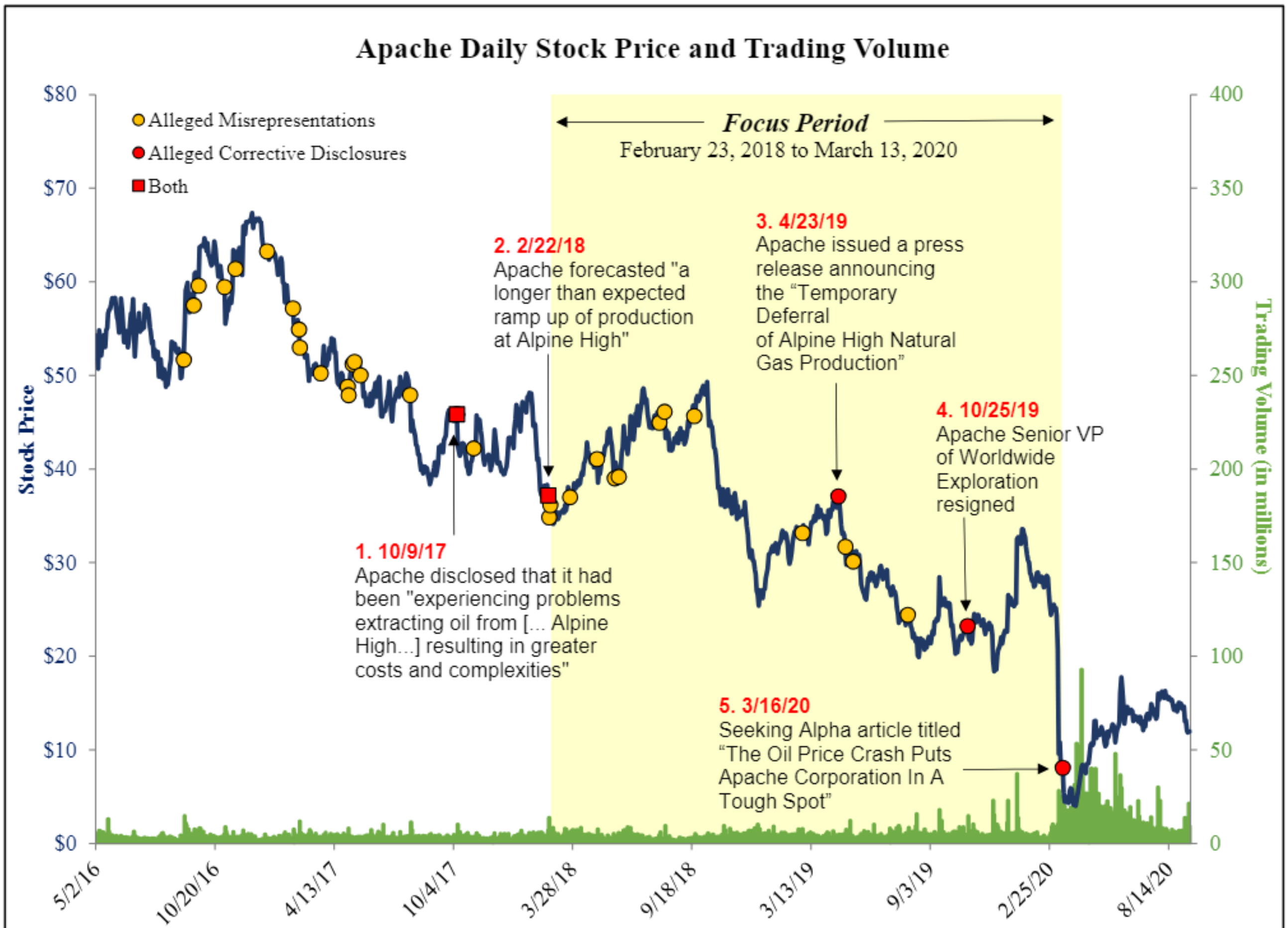
[12] Complaint, ¶¶313-314.

[13] Complaint, ¶315. See also, "The Oil Price Crash Puts Apache Corporation In A Tough Spot," *Seeking Alpha*, March 16, 2020.



Notes and Sources:
Data from Bloomberg, L.P. Events from the Complaint.

VI. METHODOLOGY

20. An analysis of price impact is an analysis of whether the alleged misrepresentations affected the market price when made.[14] In general, the price impact of an alleged misrepresentation can be analyzed in at least two ways: (1) directly by analyzing the market reaction following an alleged misrepresentation, including analyzing the stock price movement and examining market and analyst commentary following the alleged

[14] See, for example, *Halliburton I*, 131 S. Ct. 2179, 2186 (2011). ("'[P]rice impact' – that is, whether the alleged misrepresentations affected the market price in the first place.")

misrepresentations, or (2) indirectly by analyzing the market reaction to a disclosure that is corrective of an alleged misrepresentation.[15]

21. To analyze price impact of the alleged misrepresentations and omissions during the Focus Period in this case, I examined publicly available information related to Apache and Plaintiffs' allegations. I reviewed Plaintiffs' claims in the Complaint and the Nye Report, and examined the alleged misrepresentations and the alleged corrective disclosures during the Focus Period (including what information was allegedly false, when the alleged truth was purportedly revealed to the market and what information was alleged to be corrective). I analyzed publicly available information on Apache, including analyst reports, press releases, conference call transcripts, SEC filings, and news stories from Bloomberg and Factiva.[16] I focused on what the market knew about the alleged misrepresentations during the Focus Period, and on how the market reacted in terms of analyst and other market commentary and price reactions to the alleged misrepresentations.

22. Analyst reports are periodic reports issued by professional financial analysts at brokerage firms who perform research and analysis on specific industries and companies. Analysts analyze companies by studying publicly available information, such as SEC filings, as well as participating on conference calls and attending investor conferences where they can ask

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[15] See, for example, *Halliburton II*, 134 S. Ct. 2398 (2014).

Note that simply testing whether there were statistically significant price reactions on the dates of the alleged corrective disclosures may not be a reliable analysis of price impact of the alleged misrepresentations for a number of reasons, including the following:

1. The alleged corrective disclosures may not actually be corrective of the alleged misrepresentations. (If the alleged corrective disclosures are not in fact corrective, they cannot help one determine the price impact of the alleged misrepresentations);
2. The alleged corrective disclosure dates may not properly correspond to when the alleged misrepresentations were first corrected in the market. (Since, in an efficient market, only new news should affect a security's price, the reaction to repeated news is not a reliable indicator of what the price impact of the news would be initially. If news that is not new affects the price, then that is an indication that the market is not efficient.)
3. The price reaction on the alleged corrective disclosure dates may be the result of confounding factors or news unrelated to the alleged fraud; and
4. Market conditions may have changed between the time that the alleged misrepresentations were made and the time of the alleged corrective disclosures.

[16] Bloomberg is a commonly used provider of financial data and news. Factiva is an online news reporting service and archive owned by Dow Jones & Company, Inc. that aggregates news content from nearly 33,000 sources from around the world.

questions directly to management. Analysts use this information to model and value companies and industries, using financial techniques such as discounted cash flow models and valuation multiples. Using these valuations, analysts typically issue price targets (*i.e.*, what price they expect the stock of a company to be in a certain time period), provide estimates reflecting their expectations of the company's future financial performance (such as estimates of future revenue, profits and earnings per share ("EPS")), and give recommendations to buy, hold or sell the stock. Analysts typically issue reports after new information about the company is released. These reports play an important role in disseminating information about a stock and can be a valuable source of information on market knowledge and sentiment at the time.[17]

23. The review of analyst reports is a standard and generally accepted methodology for determining what information is important to the market in valuing a stock, and thus, for determining whether a piece of information had price impact.[18] This position is echoed in the Nye Report, which states:

> Securities analysts research and report to investors on the financial condition and prospects of a covered company. Analysts are conduits to the market for information collected from on-site visits, conference calls accompanying key company announcements, and other contacts with senior management. Analysts can channel new information to the market rapidly through their published reports, online reporting services, and alerts given to clients and other employees of the same investment firm. Analysts thus facilitate the dissemination of new information to investors and any corresponding price reaction in a company's securities.[19]

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17 In particular, courts have relied on analyst reports in determining what information is important to the market in valuing a stock and in determining the cause of stock price movements. See, for example, *In Re TECO Energy Inc. Securities Litigation*, 2006 U.S. Dist. LEXIS 18101 (M.D. Fla. March 30, 2006) ("Specifically, the analyst reports on September 3, 2002, September 23, 2002, October 8, 2002, and January 23, 2003 address ratings cuts, opinions, and predictions regarding TECO's stock value but do not reference any misstatements, omissions, or accounting practices by Defendants as the reason for the bleak forecasts or changes in market conditions.") and *Barrie v. Intervoice-Brite, Inc.*, 2006 U.S. Dist. LEXIS 69299 (N.D. Tex. Sept. 25, 2006) ("Barry's review of analyst reports and the public press also shows that those information sources did not link the June 6 disclosure to any prior earnings or revenues that were supposedly overstated."). The First Circuit has also recommended analyzing contemporaneous content for explaining stock price movements, citing a paper that specifically describes performing content analysis of analyst reports and commentary. *Bricklayers & Trowel Trades International Pension Fund v. Credit Suisse Securities (USA) LLC*, 752 F.3d 82, 92 (1st Cir. 2014), citing David Tabak, "Making Assessments About Materiality Less Subjective Through the Use of Content Analysis," 2007.

18 Courts often look to the number of analyst reports published on a company as an indication of market efficiency. See, for example, *Cammer v. Bloom*, 711 F. Supp. 1264 (D.N.J. 1989).

19 Nye Report, ¶33.

24. There were over 600 analyst reports issued by 24 analysts covering Apache during the alleged Class Period and over 400 analyst reports issued by 24 analysts covering Apache during the Focus Period.[20]

25. Plaintiffs and Dr. Nye assert that the market for Apache's stock was efficient during the alleged Class Period, and thus, that Apache's stock price "promptly responded to the disclosure of new, unexpected, value relevant information."[21] For the purpose of this report, I have been asked to assume Plaintiffs' claim of market efficiency.

26. In an efficient market, new publicly available information is rapidly impounded into the stock price, and known news would not be expected to trigger a price reaction.[22] Researchers have found that stock prices react "almost immediately" to the release of new information.[23] For example, according to *Investments*, a commonly cited finance textbook, the

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[20] Based on available analyst reports from Refinitiv Eikon, the Company, and Dr. Nye's turnover materials.

[21] Nye Report, ¶60.

[22] See, for example, Shleifer, Andrei, *Inefficient Markets* (Oxford University Press: New York, NY, 2000), p. 5 ("The principal hypothesis following from quick and accurate reaction of prices to new information is that stale information is of no value in making money, as Fama (1970) points out. […] The quick and accurate reaction of security prices to information, as well as the non-reaction to non-information, are the two broad predictions of the efficient markets hypothesis."). See, as another example, Shiller, Robert J., "From Efficient Markets Theory to Behavior Finance," *Journal of Economic Perspective*, 17.1 (2003), 83-104 ("Different forms of the efficient markets model differ in the choice of the discount rate in the present value, but the general efficient markets model […] asserts that any surprising movements in the stock market must have at their origin some new information about the fundamental value [of a share]").

See, also, Cornell, Bradford, *Corporate Valuation* (McGraw-Hill: New York, NY, 1993), pp. 38, 41-42, Brealey, Richard A., Stewart C. Myers and Franklin Allen, *Principles of Corporate Finance* (McGraw-Hill: New York, NY, 10th ed., 2011), p. 330, Bodie, Zvi, Alex Kane, and Alan J. Marcus, *Investments* (McGraw-Hill: New York, NY, 10th ed., 2014), p. 351, and Berk, Jonathan and Peter DeMarzo, *Corporate Finance* (Pearson: Boston, MA, 3rd ed., 2014), pp. 295-296.

Courts have similarly noted that confirmatory news should not cause a statistically significant price reaction. See, for example, *Greenberg v. Crossroads Sys., Inc.*, 364 F.3d 657 (5th Cir. 2004). ("[C]onfirmatory information has already been digested by the market and will not cause a change in stock price.").

[23] See, for example, Cornell, Bradford, *Corporate Valuation* (McGraw-Hill: New York, NY, 1993), p. 42 and Ross, Stephen A., Randolph Westerfield, and Jeffrey F. Jaffe, *Corporate Finance* (McGraw-Hill/Irwin: Boston, MA, 6th ed., 2002), p. 342 ("In an efficient market, the price of shares […] will immediately adjust to this new information. Investors should not be able to buy the stock on Wednesday afternoon and make a profit on Thursday. This would imply that it took the stock market a day to realize the implication of the FCC press release. The efficient-market hypothesis predicts that the price […] on Wednesday afternoon will already reflect the information contained in the Wednesday morning press release.").

As another example, a paper cited in the Nye Report suggests that an event study should compare a stock price movement that is "contemporaneous" with the event investigated. Nye Report, footnote 106; Mitchell, Mark L. and Jeffry M. Netter, "The Role of Financial Economics in Securities Fraud Cases: Applications at the Securities and Exchange Commission," *The Business Lawyer*, (Vol. 49, 1994), pp. 557, 558. ("The execution of an event study is quite simple. It involves the identification of an event that causes investors to change their expectations

majority of the stock's price response to a company announcement of earnings or dividends has already occurred within five to ten minutes after the announcement.[24] Thus, if new information material to investors is disclosed in an efficient market, one would expect an almost immediate reaction in the stock price to the first public announcement of such material news; if old news is repeated or expected information is confirmed to the market, one would not expect a reaction in the stock price. Thus, a test of whether certain information affects the stock price is a test of whether the stock price reacts when the information is first publicly disclosed.

27. Moreover, according to finance theory, the only information that affects the stock price is information that affects the market's expectation of the discounted value of future cash flows.[25] Thus, a change in accounting metrics that does not affect the market's expectation of the discounted value of future cash flows would not be expected to affect the stock price.[26] If the stock price reflected some other measure of income, such as accounting earnings rather than cash flow, that would be evidence that the market was inefficient.[27]

28. An event study can be used to test whether a stock's price reacts to a particular announcement. An event study is a commonly accepted statistical analysis that measures the movement in a stock's price after an event or public announcement, typically adjusting for the

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about the value of a firm. The investigator compares a stock price movement contemporaneous with the event to the expected stock price movement if the event had not taken place.")

[24] Bodie, Zvi, Alex Kane, and Alan J. Marcus, *Investments* (McGraw-Hill: New York, NY, 10th ed., 2014), p. 351, citing James M. Patell and Mark A. Wolfson, "The Intraday Speed of Adjustment of Stock Prices to Earnings and Dividend Announcements," *Journal of Financial Economics*, 13: 1984. See, also, Brealey, Richard A., Stewart C. Myers and Franklin Allen, *Principles of Corporate Finance* (McGraw-Hill: New York, NY, 7th ed., 2003), pp. 351-353.

[25] See, for example, Brealey, Richard A., Stewart C. Myers and Franklin Allen, *Principles of Corporate Finance* (McGraw-Hill: New York, NY, 10th ed., 2011), p. 74.

[26] Cornell, Bradford, *Corporate Valuation* (McGraw-Hill: New York, NY, 1993), p. 104 ("The argument that 'only cash matters' has more than theoretical backing; it is also supported by extensive research. This research focuses on listed companies for which it is possible to conduct direct tests of the relation between value and various measures of income, including cash flow and accounting earnings, because market values for listed companies can be estimated by the stock and debt approach. The results of these tests overwhelmingly support the view that corporate value is based on cash flow. When cash flow and earnings diverge, changes in value are associated with changes in cash flow, not changes in earnings.").

[27] See, for example, Brealey, Richard A., Stewart C. Myers and Franklin Allen, *Principles of Corporate Finance* (McGraw-Hill: New York, NY, 7th ed., 2003), p. 366 ("In an efficient market there are no financial illusions. Investors are unromantically concerned with the firm's cash flows and the portion of those cash flows to which they are entitled.").

movement in the overall market and/or industry.[28] Academics often use an event study to determine how stock prices respond to new information.[29] An event study typically uses a statistical analysis called a regression to estimate the relationship between the company's daily stock returns and the daily returns of market and/or industry indices.[30] Using the regression results and the returns of the indices, the predicted stock price movement and abnormal stock price movement (or the amount the stock price moves in excess of the predicted amount) can be calculated for the event/period being tested. Then, the statistical significance of the abnormal stock price movement can be tested based on the range of normal expected daily variation in stock prices.

29. In particular, when analyzing the statistical significance of a price reaction to an event, the 5% statistical significance level (*i.e.*, the 95% statistical confidence level) is the commonly applied standard.[31] If a price reaction is *not* statistically significant, it means that it is within the range of normal expected daily variation in stock prices and cannot be statistically distinguished from zero.

30. Statistical significance is commonly misinterpreted. One example of these misinterpretations is that if a price reaction is statistically significant at the 23% level (*i.e.*, the p-value is 0.23), it means that one can be 77% confident that the stock price reacted to the event. However, this is *flatly wrong*.[32] For example, according to the former president of the American

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[28] See, for example, Alexander, Janet C., "The Value of Bad News in Securities Class Actions," *UCLA Law Review*, 41: 1994, Fischel, Daniel R., "Use of Modern Finance Theory in Securities Fraud Cases Involving Actively Traded Securities," *The Business Lawyer* 38: 1982, and Dunbar, Frederick C., and David I. Tabak, "Materiality and Magnitude: Event Studies in the Courtroom," *Litigation Services Handbook: The Role of the Financial Expert* (John Wiley & Sons, Inc.: New York, NY, 3rd ed., 2001), ch. 19.

[29] See, for example, MacKinlay, A. Craig, "Event Studies in Economics and Finance," *Journal of Economic Literature*, 35: 1997, and Bowman, Robert G., "Understanding and Conducting Event Studies," *Journal of Business Finance & Accounting*, 10(4): 1983.

[30] Regression analysis is used to estimate the relationship between two or more variables. See, for example, Hogg, Robert V. and Elliot A. Tanis, *Probability and Statistical Inference*, (Prentice Hall: Upper Saddle River, NJ, 5th ed., 1997).

[31] The 5% level is the level most commonly applied by courts and academics to test statistical significance. For a discussion of statistical significance levels, *see,* for example, Freedman, David A., and David H. Kaye, "Reference Guide on Statistics," *Reference Manual on Scientific Evidence* (Washington, D.C.: Federal Judicial, pp. 243-246.

[32] See, for example:

- Freedman, David A., and David H. Kaye, "Reference Guide on Statistics," *Reference Manual on Scientific Evidence* (Washington, D.C.: Federal Judicial Center, 3rd ed., 2011) p. 252. ("[I]f results are significant at the 5% level, it is tempting to conclude that the null hypothesis has only a 5% chance of

Financial Association, it is "incorrect to interpret the test as providing (1 – p-value)% confidence that the effect being tested is 'true.'"[33] In other words, it is incorrect to interpret the test as providing 77% confidence that the effect being tested is true. Instead, it means that there is only a 23% chance that a price reaction of the same magnitude would be observed given the range of normal stock price volatility.[34]

31. The lack of a statistically significant price reaction is considered by academics,[35] as well as courts,[36] as providing compelling evidence of no price impact. For example, according

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being correct. This temptation should be resisted."); and p. 282. ("However, the 5% is often taken to be the chance of the null hypothesis given the data. This misinterpretation is commonplace in the social science literature, and it appears in some opinions describing expert testimony.")

- Barnes, David W., "Too many probabilities: statistical evidence of tort causation," *Law and Contemporary Problems* 64(191): 2001, p. 208. ("There is no convenient way to translate the .05 pvalue into a ninety-five-percent confidence that the fact probability is correct, credible, believable, or true.")

See, in addition, the following video from Khan Academy on "P-values and significance tests" for a simpler explanation of this concept. ("Sometimes people confuse this [the p-value] and they say: Hey is this the probability that the null hypothesis is true given the sample statistics that we got? And I would say, clearly, no, that is not the case. We are not trying to gauge the probability that the null hypothesis is true or not.") Khan Academy, accessed at: https://www.khanacademy.org/math/ap-statistics/xfb5d8e68:inference-categorical-proportions/idea-significancetests/v/p-values-and-significance-tests.

33 Harvey, Campbell R., "Presidential Address: The Scientific Outlook in Financial Economics," *The Journal of Finance* 77(4): 2017, p. 1410 ("The p-value does not indicate whether the null hypothesis or the underlying experimental hypothesis is 'true.' It is also incorrect to interpret the test as providing (1 – p-value)% confidence that the effect being tested is true.").

34 See, for example, Freedman, David A., and David H. Kaye, "Reference Guide on Statistics," *Reference Manual on Scientific Evidence* (Washington, D.C.: Federal Judicial Center, 3rd ed., 2011) p. 250.

35 See, for example, Freedman, David A., and David H. Kaye, "Reference Guide on Statistics," *Reference Manual on Scientific Evidence* (Washington, D.C.: Federal Judicial Center, 3rd ed., 2011), p. 254.

See, also, the study in the *International Journal of Economics and Finance* which concludes there is no impact from an event given the lack of a statistically significant reaction: "On the announcement day (day zero), the abnormal return for the bank sector is -0.066% and for both the service and industrial sector is -0.293% and -0.368% respectively, with no significant impact as the t-statistics accept the null hypothesis that the downgrading event has no impact." See, Abdeldayem, Marwan M. and Ramzi Nekhili, "Credit Rating Changes and Stock Market Reaction in the Kingdom of Bahrain," *International Journal of Economics and Finance*, 8(8):2016, pp. 23-32. See, also, Fisher, Franklin M., "Multiple Regression in Legal Proceedings," *Columbia Law Review*, 80(4): 1980.

36 See, for example, Erica P. John Fund, Inc. v. Halliburton Company, No. 3: 02-CV-1152-M (N.D. Tex. July 25, 2015, ("To show that a corrective disclosure had a negative impact on a company's share price, courts generally require a party's expert to testify based on an event study that meets the 95% confidence standard […] Coffman found an intraday statistically significant price reaction on Day 1 only at a 90% confidence level, which is less than the 95% confidence level both experts require in their regression analyses and which the Court finds is necessary. […] In contrast, with and without a multiple comparison adjustment, Allen found no price impact on December 21, 2000. The Court agrees with Halliburton that there was no price impact on December 21, 2000, and finds that Defendants have rebutted the *Basic* presumption as to the allegedly corrective disclosure made on that date.").

to the Reference Manual on Scientific Evidence "**when studies have a good chance of detecting a meaningful association, failure to obtain significance can be persuasive evidence that there is nothing much to be found**."[37] Note that Plaintiffs and Dr. Nye's proposed common damages methodology includes the use of an event study to determine "Company-specific price movements caused by the revelation of true facts related to the alleged fraud," clearly indicating that Plaintiffs and Dr. Nye believe their proposed event study approach has a "good chance of detecting a meaningful association."[38] Thus, in this context, if Dr. Nye's event study yields no statistically significant price reaction, it would provide evidence of no price impact.[39] A practical example that the lack of a statistically significant price reaction provides evidence of the lack of impact is the FDA's approval requirement for trials on drug efficacy. Specifically, if a statistical test of the hypothesis that a drug is more effective than a placebo fails at the 5% statistical significance level (*i.e.*, there is no statistically distinguishable difference in efficacy between the drug and a placebo), then the drug is rejected—the lack of statistical significance provides evidence that the drug is not better than a placebo.[40]

32. I tested Apache's stock price reactions using both the event study methodology put forward by Dr. Nye as well as an alternative event study methodology. Dr. Nye's event study model uses the S&P 500 Index, an index of 500 large companies listed on the NYSE and the NASDAQ, to control for market movements, and a market-capitalization weighted index Dr. Nye constructed using constituents of the S&P 500 Oil & Gas Exploration and Production Index to control for industry movements.[41] Dr. Nye uses a rolling control period of one calendar year

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[37] Freedman, David A., and David H. Kaye, "Reference Guide on Statistics," *Reference Manual on Scientific Evidence* (Washington, D.C.: Federal Judicial Center, 3rd ed., 2011), p. 254, emphasis added.

See, also, the study in the *International Journal of Economics and Finance* which concludes there is no impact from an event given the lack of a statistically significant reaction: "On the announcement day (day zero), the abnormal return for the bank sector is -0.066% and for both the service and industrial sector is -0.293% and -0.368% respectively, with no significant impact as the t-statistics accept the null hypothesis that the downgrading event has no impact." See, Abdeldayem, Marwan M. and Ramzi Nekhili, "Credit Rating Changes and Stock Market Reaction in the Kingdom of Bahrain," *International Journal of Economics and Finance*, 8(8):2016, pp. 23-32. See, also, Fisher, Franklin M., "Multiple Regression in Legal Proceedings," *Columbia Law Review*, 80(4): 1980.

[38] Nye Report, ¶67.

[39] Note this assumes that there is no confounding news.

[40] See, for example, Kennedy-Shaffer, Lee, "When the Alpha is the Omega: P-Values, 'Substantial Evidence,' and the 0.05 Standard at FDA," *Food Drug Law Journal*, 72(4): 2017, pp. 595-635, which describes the history of the use of statistics by the FDA in the decision-making process for new drugs.

[41] Nye Report, ¶75 and "NYE_00000001.xlsx." Dr. Nye's industry index construction excludes Apache's returns.

prior to each event. Dr. Nye claims to exclude the "events under study" (*i.e.*, "dates during the alleged Class Period on which Apache released quarterly or year-end financial results and/or financial guidance") from his control period.[42] However, in addition to excluding those events, Dr. Nye also excludes earnings announcements before the alleged Class Period (which he does not "study") and non-earnings-related alleged corrective disclosures identified in the Complaint.[43]

33. The alternative event study controls for market movements with the S&P 500 Index and industry movements with the S&P Oil & Gas Exploration & Production Select Industry Index (the "S&P E&P Index"), an off-the-shelf index of publicly traded oil and gas E&P companies, after removing the effects of the returns of Apache's stock price.[44] It uses a rolling control period of 252 trading days, or approximately one calendar year, prior to each event, excluding the alleged corrective disclosure dates. Overall, the alternative event study has a higher explanatory power than Dr. Nye's event study.[45]

34. My conclusion of no price impact and no link between any of the alleged misrepresentations made during the alleged Class Period and Apache's stock price during the Focus Period does not depend on which event study model is used.

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42 Nye Report, ¶¶57,73.

43 "NYE_00003044.xlsx." See also, Nye Report, footnote 125.

44 Data obtained from Bloomberg, L.P. using the tickers SPX and SPSIOP. To remove the effect of the returns of Apache's stock price on the market and industry indices, I used the weight of Apache's stock in the S&P 500 and S&P Oil & Gas Exploration & Production Select Industry Index on each day. The S&P Oil & Gas Exploration & Production Select Industry Index includes "[s]tocks […] classified in the GICS oil & gas exploration & production sub-industry." See, "S&P Oil & Gas Exploration & Production Select Industry Index," *S&P Dow Jones Indices*, as of April 28, 2023.

45 For example, on the majority of dates tested (alleged misrepresentations and alleged corrective disclosures during the Focus Period), the alternative event study has a higher adjusted R-squared than Dr. Nye's event study.

VII. A Detailed Analysis of the Focus Period Shows No Price Impact and No Link with Any of the Alleged Misrepresentations Made During the Alleged Class Period

A. An analysis of each of the alleged misrepresentations made during the Focus Period shows no evidence of price impact

35. From my review of the Complaint, I do not understand Plaintiffs to be claiming that the alleged misrepresentations during the Focus Period increased the alleged inflation in the stock price when made, but to be thorough, as part of my price impact analysis, I analyzed the market reaction following the alleged misrepresentations during the Focus Period, including analyzing the stock price reaction and examining market and analyst commentary following the alleged misrepresentations, and found no evidence of a price reaction to the alleged misrepresentations when made.

36. The table below shows the price reactions following the alleged misrepresentations during the Focus Period, according to both Dr. Nye's event study model and the alternative event study model. There was no statistically significant increase on 12 of the 13 trading days following the alleged misrepresentations.

Apache Stock Price Reactions Following Alleged Misrepresentations

				Nye Event Study		Alternative Event Study	
	Event Date	Reaction Date	Event	% Price Reaction	Stat. Sig. Increase?[1]	% Price Reaction	Stat. Sig. Increase?[1]
1.	2/22/18 [2]	2/23/18	2017 Form 10-K	0.4%	No	1.1%	No
2.	2/26/18	2/26/18	DUG Executive Conference	-0.6%	No	-0.9%	No
3.	3/26/18	3/26/18	Investor Presentation	-1.6%	No	-1.4%	No
4.	5/3/18	5/3/18	1Q18 Conference Call	-5.3%	No	-4.4%	No
5.	5/30/18	5/30/18	Annual Bernstein Strategic Decisions Conference	0.5%	No	0.6%	No
6.	6/5/18	6/5/18	June Marketing Presentation	1.1%	No	0.6%	No
7.	8/2/18	8/2/18	2Q18 Conference Call	-1.4%	No	-1.5%	No
8.	8/8/18	8/9/18	Conference Call to Discuss Altus Transaction	-5.8%	No	-5.4%	No
9.	9/21/18	9/21/18	Bloomberg Commodities Edge Interview	-0.4%	No	-0.4%	No
10.	2/28/19	3/1/19	2018 Form 10-K	0.2%	No	0.4%	No
11.	5/1 - 5/2/19 [3]	5/2/19	1Q19 Press Release and Conference Call	-3.5%	No	-3.2%	No
12.	5/14/19 [4]	5/14/19	Bloomberg Story	1.3%	No	0.4%	No
13.	7/31 - 8/1/19 [5]	8/1/19	2Q19 Press Release and Conference Call	3.6%	Yes	4.8%	Yes

Notes and Sources:

Data from Bloomberg L.P. and "NYE_00003032.xlsx." Events from the Complaint.

[1] Significance is based on the price reaction's t-statistic, calculated as the price reaction divided by the standard error of the regression over the control period. "Yes" indicates that the price increase is statistically significant at the 5% level.

[2] The Complaint states that the 2017 Form 10-K was filed on February 23, 2018 (Complaint ¶258); however, according to SEC's website it was filed on February 22, 2018 after market hours.

[3] The Complaint states that the press release was issued on May 2, 2019 (Complaint ¶273-274); however, according to a GlobeNewswire article dated May 1, 2019, the press release was issued on May 1, 2019 after market hours.

[4] The Complaint states that the Bloomberg story was published on May 15, 2019 (Complaint ¶275); however, according to Bloomberg, it was published on May 14, 2019.

[5] The Complaint states that the press release was issued on August 1, 2019 (Complaint ¶278-279); however, according to a GlobeNewswire article dated July 31, 2019, the press release was issued on July 31, 2019 after market hours.

37. I analyzed market and analyst commentary following the 12 alleged misrepresentations after which there was *no* statistically significant price increase, including examining potential negative confounding news, to see if there was any evidence that any of these alleged misrepresentations could have caused an increase in Apache's stock price. I found that on these 12 dates, there was no indication that any analyst increased their price target or valuation of Apache due to the alleged misrepresentations.

38. Regarding the one alleged misrepresentation that did have a statistically significant price increase, I reviewed market and analyst commentary following that alleged misrepresentation to determine whether there was any evidence that the alleged misrepresentation caused the statistically significant price increase on that day. I found no evidence that the price increase was due to the alleged misrepresentation, but instead found that the price increase was due to positive news unrelated to the alleged misrepresentation.

39. Specifically, Plaintiffs allege that Apache made misstatements in its 2Q19 press release and conference call on July 31, 2019 and August 1, 2019 respectively. In the press release, which was released after market hours on July 31, Plaintiffs claim Defendants misstated that Alpine High's delayed "production" was temporary and Apache would "catch up in the second half of 2019 and exit the year with oil production on plan and with strong momentum heading into 2020."[46] In the conference call, which occurred during market hours on August 1, Plaintiffs claim Defendants falsely stated that "we like the asset [Alpine High]. It's a large resource as we've proven. There is tremendous rich-gas potential."[47]

40. Analyst commentary indicates that the price increase on this date was due to Apache's 2Q19 EPS and EBITDAX[48] beating consensus and production beating guidance. For example, analysts stated that Apache had "solid 2Q19 results" and "beat on several metrics:"

> APA announced 2Q19 results and provided 3Q19 guidance. Total production of ~455 Mboepd was ~1% above our estimate. […] Overall, Apache posted solid 2Q19 results (EBITDAX beat & lower capex), though 3Q guide is a little noisy [.] [Stephens, 8/1/19]

> APA's 2Q2019 results beat on several metrics with production higher than guidance both domestically and internationally. […] **2Q19 Earnings:** APA reported an adjusted net gain of $0.11 per share for the quarter, beating our and the street's $0.07 estimate. Reported adj. EBITDAX of $994 million came in near our $996 MM estimate, beating the $968 MM consensus estimate. U.S. and company-wide production (Ex-Egypt noncontrolling interest) beat guidance of 260 and 396 MBOED, respectively, while International was in line with guided 132 MBOED. [MUFG, 8/2/19, emphasis original]

41. Dr. Nye similarly states that the statistically significant price increase on this day was due to the beat and "consistent with that expected in an efficient market." Dr. Nye does not attribute the price increase to the alleged misrepresentation. According to Dr. Nye:

> Given that: (i) the Company's "2Q2019 results beat on several metrics with production higher than guidance"; (ii) "[l]ike its peers, the company was hit by weak realized prices for natural gas and natural gas liquids in the quarter"; and

[46] Complaint, ¶278. Note the Complaint states that the press release was issued on August 1, 2019. However, it was issued on July 31, 2019 after market hours. See, for example, "Apache Corporation Announces Second-Quarter 2019 Financial and Operational Results," *GlobeNewswire*, July 31, 2019, 9:46 p.m.

[47] Complaint, ¶279 and Apache 2Q19 earnings conference call, August 1, 2019.

[48] EBITDAX refers to earnings before interest, taxes, depreciation, amortization, and exploration expenses. See, for example, "Apache Corporation Announces Second-Quarter 2019 Financial and Operational Results," *Apache Press Release*, July 31, 2019.

> (iii) "expectations for the [Company's] print … were relatively aligned with the challenging operational backdrop for APA," the statistically significant Company-specific stock price increase on August 1, 2019 is consistent with that expected in an efficient market. [Nye Report, Exhibit 12]

42. Further, there is no indication that any analysts increased their valuation of Apache due to the alleged misrepresentation. In fact, some analysts *lowered* their expectations for Alpine High following the release of 2Q19 results. For example, analysts at UBS reduced their price target due to concerns about Alpine High's exposure to weakening commodity prices.

> Weak natural gas and NGL pricing in the quarter and a deteriorating macro have also caused us to trim realizations in 2H19 and 1H20. The weaker pricing has led APA to shut in wells [at Alpine High], and we remain cautious on GCX completely addressing the issue. **The combination of the above has led us to reduce our estimates by ~10% going forward and as a result we are reducing our PT to $21 / sh.** The real option value for APA though is its exploration potential in Suriname; an exploratory well is expected to spud in September. [UBS, 8/5/19, emphasis added]

43. Note Plaintiffs claim that Apache made misstatements on February 23, 2017, August 3, 2017, and February 22, 2018 about Alpine High being economic at low commodity prices.[49] I find no price impact during the Focus Period from these alleged misstatements and no link between these alleged misstatements and any of the three alleged corrective disclosures during the Focus Period, since following these alleged misstatements, no analysts mentioned these alleged misstatements or incorporated these alleged misstatements into their valuation of Apache and there was no statistically significant increase following these misstatements according to both Dr. Nye's event study model and the alternative event study model. On the contrary, following these alleged misstatements, analysts explicitly stated that weak commodity prices would challenge the economics of Alpine High. During the Focus Period, analysts consistently repeated that deteriorating commodity prices would drive expectations about Alpine High downward. For example:

- In a report issued on February 23, 2017, analysts at Bank of America stated that a "key risk" to Apache's Alpine-High-gas-driven growth would be worsened Waha

[49] Complaint, ¶¶224-226, 244-245, 256-257, 260.

Hub prices due to a surge in local production.[50] As will be discussed in detail in Section VII.B.1, this risk materialized in 2019.

- On February 22, 2018, Bank of America analysts stated that there was "no visibility" of the long-term commodity price outlook, which would challenge Apache's investment in Alpine High. The analysts further stated having "conviction" about the value of Apache's gas-driven growth was "too difficult" and reiterated their "underperform" rating of Apache's stock.[51]

- On August 2, 2018, consistent with their prior statements that deteriorating commodity prices would drive expectations about Alpine High downward, Bank of America analysts explicitly stated that in expectation of gas prices trending towards $2.50, Alpine High would not be expected to drive strong cashflow growth despite Apache's good execution in the Alpine High play.[52]

- A Credit Suisse analyst report on February 22, 2018 stated that Alpine High "naysayers" were unlikely to change their view about the play, as investor concerns about weakening Waha Hub prices continued to grow.[53]

[50] Bank of America analyst report, dated February 24, 2017 ("[T]he majority of the planned growth is Alpine High gas, which we expect to dilute APA's multiple versus peers. A key risk, in our view, is the impact of a flood of new gas production on regional differentials, specifically at Waha hub, leaving APA's unit cash margins at risk vs oil levered peers.").

[51] Bank of America analyst report, dated February 22, 2018 ("Apache's commitment to its Alpine High development continues to anchor an investment outlook that is complicated by the challenges of setting in motion a major project development, absent existing infrastructure and where the longer term outlook on realized prices has no visibility. Still, with 4Q17 earnings, management has endeavored to improve guidance, providing a medium term outlook on how production will evolve and the role that will be increasingly played by gas production as the key driver of growth. But when faced with a weak US natural gas price outlook and uncertain basis, we think the change in mix towards a higher proportion of gas is simply too difficult to have conviction on value until actual prices, costs and cashflow are tangible. Reiterate Underperform.").

[52] Bank of America analyst report, dated February August 2, 2018 ("There is no doubt APA is executing well in the Alpine high. But with our house view of US gas prices trending towards $2.50, with basis discounts applied when APA secured long term tariff to the US Gulf Coast, we struggle to see strong top line growth converted to strong cashflow growth versus more oil levered peers.").

[53] Credit Suisse analyst report, dated February 22, 2018 ("Today's update and guidance outlook is unlikely to turn the Alpine High "naysayers" more positive on APA. […] While APA expects its volumes in the play to grow at a >150% CAGR reaching ~160-180 MBoed by 2020, the company "conservatively" expects its oil mix in the play to stay flat with 4Q17 levels at just 7% as growth will predominantly come from natural gas and NGLs given its drilling program will be weighted towards deeper drilling for acreage retention purposes. Notably, this growth is coming at a time when investors are increasingly concerned about Waha basis blowing out even further (is currently ~$0.90/Mcf) as associated gas volumes ramp in the Delaware Basin (Anadarko Petroleum's

44. Moreover, as will be discussed in detail in Section VIII.C, throughout the Focus Period and even after the Focus Period, analyst commentary shows no link between the downward changes in expectations about Alpine High and any new understanding of Alpine High's reserves or the mix of oil and wet gas vs. dry gas. Instead, analysts consistently stated that downward changes in Alpine High expectations were driven by changes in commodity prices.

45. In sum, an analysis of the stock price reactions and market and analyst commentary following each of the alleged misrepresentations made during the Focus Period and the February 23, 2017, August 3, 2017, and February 22, 2018 alleged misstatements about Alpine High's economics at low commodity prices shows no evidence of price impact of the alleged misrepresentations when made.

B. An analysis of each of the alleged corrective disclosures during the Focus Period shows no price impact and no link to any of the alleged misrepresentations

46. Plaintiffs claim that the alleged "truth" regarding the alleged misrepresentations was disclosed to the market on five alleged corrective disclosures during the alleged Class Period, including three alleged corrective disclosures during the Focus Period.[54] An analysis of each of the three alleged corrective disclosures during the Focus Period shows that the alleged misrepresentations did not have price impact and that there is no link between any of the alleged misrepresentations during the alleged Class Period and Apache's stock price during the Focus Period. Moreover, there was no statistically significant price decline from any allegedly corrective information.[55]

CEO stated at our Vail Energy Summit last week he would not be surprised to ultimately see 12-15 Bcfd of associated gas production from the Permian).").

[54] Complaint, ¶¶303, 319.

[55] Plaintiffs mention four additional events during the Focus Period in Section V of their Complaint, without describing them as alleged corrective disclosures: October 31, 2019, January 9, 2020, February 26-27, 2020, and March 12, 2020. See, Complaint, ¶¶104-106, 108, 110. An analysis of these events also shows no link and no price impact from any of the alleged misrepresentations. Below is a brief description of these events and the results of the analysis.

1. October 31, 2019 announcement of reduced activity at Alpine High: There was no statistically significant decline following the announcement according to both Dr. Nye's event study model and the alternative event study model. The reduced Alpine High activity was expected given the continued weakness in gas and NGL pricing.
2. January 9, 2020 article on the shutdown of Alpine High's San Antonio headquarters: There was no statistically significant decline following the article according to both Dr. Nye's event study model and

1. **The April 23, 2019 alleged corrective disclosure regarding the deferral at Alpine High did not result in a statistically significant price decline, was expected by the market given the "extremely" low gas prices, and did not change the market's expectations about Alpine High's reserves or the mix of oil and wet gas vs. dry gas**

47. Before the market opened on April 23, 2019, Apache issued a press release announcing that the Company had temporarily deferred natural gas production at Alpine High.[56] Plaintiffs claim that this press release was a "partial" alleged corrective disclosure and allegedly caused Apache's stock to decline on the same day and over the next three trading days through April 26, 2019.[57]

48. The April 23, 2019 alleged corrective disclosure shows no price impact from the alleged misrepresentations and no link to the alleged misrepresentations, including for the following reasons, which are detailed below:

a) there was **no** statistically significant decline in Apache's stock price following the April 23, 2019 press release, according to both Dr. Nye's event study model and the alternative event study model;

b) the allegedly corrective information, the deferral of gas production at Alpine High, was in response to "extremely low" regional gas prices and was expected by the market given those prices; and

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the alternative event study model. No analyst reports mentioned this article in the two weeks following its publication.

3. February 26-27, 2020 announcement of Alpine High drilling halt and impairment: There was no statistically significant decline following the announcement according to both Dr. Nye's event study model and the alternative event study model (there was a statistically significant increase). The market was aware of Alpine High's drilling halt before the announcement and Apache's pivot away from Alpine High was expected given the collapse in gas and NGL prices.

4. March 12, 2020 announcement of Apache's dividend cut by 90%: The announcement did not discuss Alpine High. Apache's dividend cut was in response to the oil price collapse around the start of the COVID-19 ("Covid") pandemic and was consistent with capital reductions at other E&P companies. According to both Dr. Nye's event study model and the alternative event study model, there was a statistically significant increase in Apache's stock price. However, as will be discussed in Section VII.B.3., both models are not applicable to this date due to heightened market volatility.

[56] Complaint, ¶310. See also, "Apache Corporation Announces Temporary Deferral of Alpine High Natural Gas Production in Response to Recent Pricing at Waha Hub," *Globe Newswire*, April 23, 2019.

[57] Complaint, ¶311.

c) the allegedly corrective information did not change the market's expectations about Alpine High's reserves or the mix of oil and wet gas vs. dry gas

No statistically significant price decline

49. I used both Dr. Nye's event study model and the alternative event study model to test whether there was any statistically significant reaction in Apache's stock following the April 23, 2019 alleged corrective disclosure.[58] According to both models, there was **no** statistically significant stock price decline on April 23, 2019, the first trading day following the alleged corrective disclosure.

50. Plaintiffs claim that the movement in Apache's stock price from April 24 to April 26, 2019 was caused by the information released on April 23, 2019. However, given that the news about Alpine High's gas deferral was released on April 23, 2019 before market open to no statistically significant price decline, any attempt to attribute the movement in Apache's stock price from April 24 to April 26, 2019 to the alleged corrective disclosure would contradict Plaintiffs' and Dr. Nye's claim that Apache's stock traded in an efficient market. As discussed above, in an efficient market, stock prices react rapidly to impound new information when it is released and, in an efficient market, stocks begin reacting to new information on the first trading day on which the news is publicly disseminated – in this case, on April 23.

51. Moreover, as shown in the tables below, there was **no** statistically significant stock price decline on April 24, April 25, or April 26, 2019, according to both Dr. Nye's event study model and the alternative event study model. The table below shows the results of Dr. Nye's event study from April 23 to April 26, 2019.

[58] The press release was issued before the market opened on April 23, 2019 and thus any reaction to the press release, in an efficient market, would be expected on April 23, 2019. See, "Apache Corporation Announces Temporary Deferral of Alpine High Natural Gas Production in Response to Recent Pricing at Waha Hub," *Globe Newswire*, April 23, 2019, 6:30 a.m.

Price Reactions Following the April 23, 2019 Alleged Corrective Disclosure

According to Nye's Event Study Model

	Date	Apache Return	Market Index Return	Industry Index Return[1]	Apache Predicted Return	% Price Reaction	t-stat	Stat. Sig. Decline?[2]
1.	4/23/19	-1.8%	0.9%	-1.3%	-0.3%	-1.4%	-1.05	No
Plaintiffs allege a four-day reaction								
2.	4/24/19	-2.6%	-0.2%	-0.3%	-0.6%	-2.0%	-1.48	No
3.	4/25/19	-4.0%	0.0%	-1.2%	-1.3%	-2.7%	-1.94	No
4.	4/26/19	-2.9%	0.5%	-2.3%	-1.9%	-1.0%	-0.73	No

Notes and Sources:

Data from "NYE_00003032.xlsx."

[1] Residual industry index return from "NYE_00003032.xlsx."

[2] Significance is based on the price reaction's t-statistic, calculated as the price reaction divided by the standard error of the regression over the control period. "Yes" indicates that the price reaction is statistically significant at the 5% level.

The table below shows the results of the alternative event study from April 23 to April 26, 2019.

Price Reactions Following the April 23, 2019 Alleged Corrective Disclosure

According to Alternative Event Study Model

	Date	Apache Return	Market Index Return	Industry Index Return	Apache Predicted Return	% Price Reaction	t-stat	Stat. Sig. Decline?[1]
1.	4/23/19	-1.8%	0.9%	-0.2%	-0.4%	-1.4%	-0.99	No
Plaintiffs allege a four-day reaction								
2.	4/24/19	-2.6%	-0.2%	-1.9%	-1.9%	-0.8%	-0.54	No
3.	4/25/19	-4.0%	0.0%	-1.5%	-1.5%	-2.5%	-1.78	No
4.	4/26/19	-2.9%	0.5%	-1.4%	-1.6%	-1.3%	-0.94	No

Notes and Sources:

Data from Bloomberg, L.P.

[1] Significance is based on the price reaction's t-statistic, calculated as the price reaction divided by the standard error of the regression over the control period. "Yes" indicates that the price reaction decline is statistically significant at the 5% level.

52. Overall, the release of information that Plaintiffs allege was corrective of the alleged misrepresentations did not cause any statistically significant decline in Apache's stock price, which demonstrates no link with any of the alleged misrepresentations and no price impact for the April 23, 2019 alleged corrective disclosure due to the alleged misrepresentations. As discussed above, the lack of an observable statistically significant price reaction is considered by academics, as well as courts, as providing evidence of no price impact.

Deferral was in response to "extremely" low gas prices and expected by the market

53. Apache's deferral of gas production at Alpine High, rather than having any link to the alleged misrepresentations made during the alleged Class Period and new information about Alpine High's reserves or the mix of oil and wet gas vs. dry gas, was expected by the market given the then "extremely" low gas prices.

54. According to Plaintiffs, Apache's press release on April 23, 2019 was an alleged corrective disclosure that disclosed "that the Company was scaling back natural gas production

efforts."[59] However, Plaintiffs leave out the reason why Apache was scaling back production at Alpine High: the recently reduced regional gas prices at Waha Hub. Apache's April 23, 2019 press release was titled "Apache Corporation Announces Temporary Deferral of Alpine High Natural Gas Production *in Response to Recent Pricing at Waha Hub*."[60] In the press release, Apache noted that the deferral at Alpine High was "in response to extremely low prices at Waha Hub."[61]

55. The Waha Hub, located in the Delaware Basin, is a major physical gathering point for natural gas from the Permian region.[62] The Waha Hub Natural Gas Spot Price is the pricing benchmark for natural gas produced in the Permian region, including at Alpine High.[63] In the four months prior to Apache's April 23, 2019 press release, the Waha Hub Natural Gas Spot Price had been declining and substantially below the Henry Hub Natural Gas Spot Price, the U.S. benchmark of natural gas pricing.[64] In particular, as shown in the chart below, the Waha Hub Natural Gas Spot Price *halved* from an average of approximately $2/MMBtu (million British thermal unit) in 2018 to approximately $1/MMBtu from the beginning of 2019 to April 22, 2019. This was in part due to the Waha Hub's abundance of natural gas production and the lack of capacity to ship away that natural gas.[65] In fact, in late March 2019, the Waha Hub Natural Gas Spot Price even went negative following unplanned pipeline failures.[66]

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59 Complaint, ¶¶310-311.

60 "Apache Corporation Announces Temporary Deferral of Alpine High Natural Gas Production in Response to Recent Pricing at Waha Hub," *Globe Newswire*, April 23, 2019, emphasis added.

61 "Apache Corporation Announces Temporary Deferral of Alpine High Natural Gas Production in Response to Recent Pricing at Waha Hub," *Globe Newswire*, April 23, 2019.

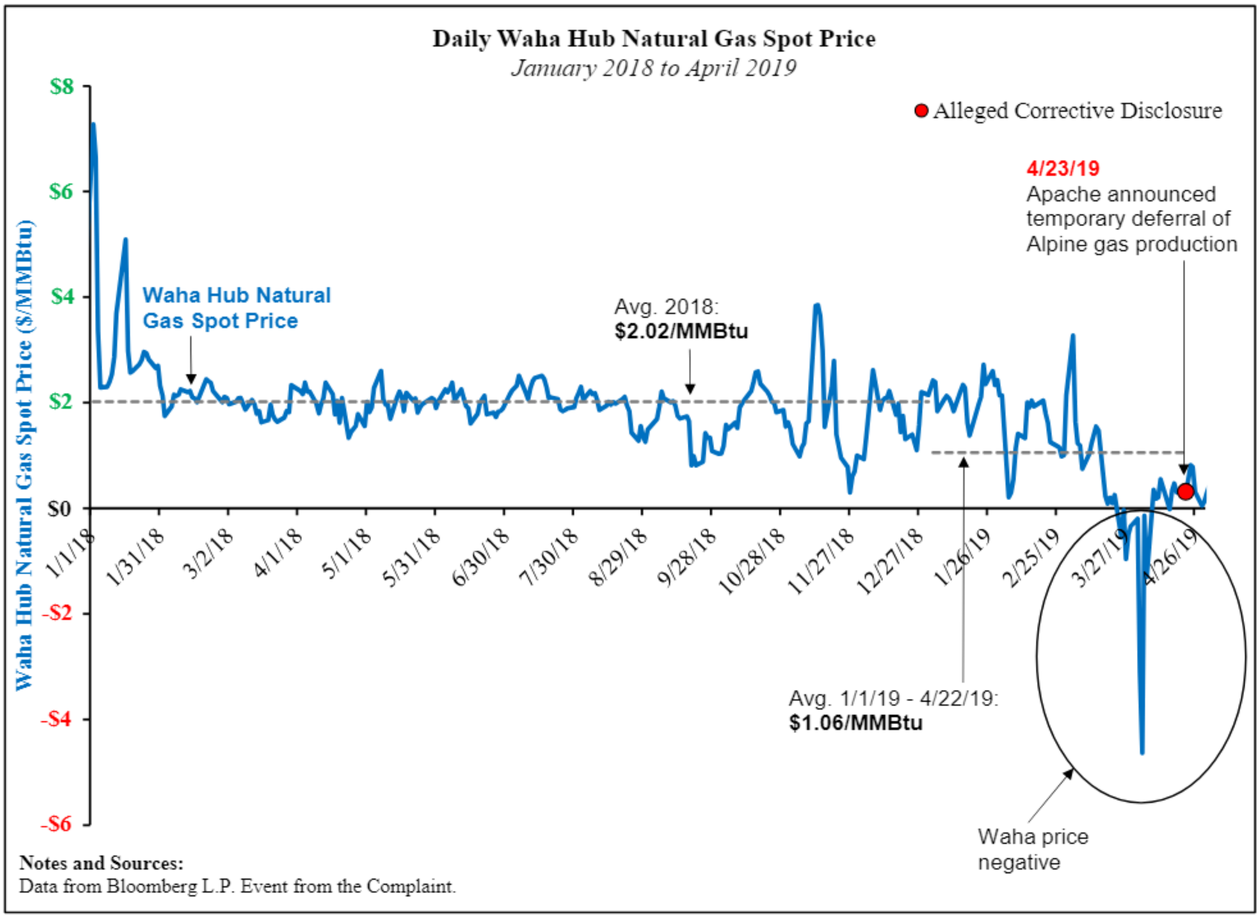
62 See, for example, "Permian Gas Price And Fundamentals," *AEGIS Hedging*, May 19, 2023.

63 See, for example, "Waha Hub spot gas' basis spread blows out on PHP maintenance," *S&P Global Commodity Insights*, May 2, 2022.

64 See, for example, "Waha Hub gas prices hit negative territory as Permian pipe restricts flow," *S&P Global Market Intelligence*, March 22, 2019 and "U.S. Henry Hub natural gas price expected to increase from recent lows," *U.S. Energy Information Administration*, March 16, 2023.

65 See, for example, "Waha Hub gas prices hit negative territory as Permian pipe restricts flow," *S&P Global Market Intelligence*, March 22, 2019.

66 See, for example, "Waha Hub gas prices hit negative territory as Permian pipe restricts flow," *S&P Global Market Intelligence*, March 22, 2019.



56. Moreover, according to analysts, Apache's announcement of the deferral of gas production at Alpine High on April 23, 2019 was expected and not a surprise to the market. Analysts indicated that the deferral was expected given the current weak regional natural gas price. For example, analysts at Scotiabank and Stephens stated that the deferral of Alpine High production was due to the "extremely low" current Waha Hub natural gas price and was not a surprise to the market.

> APA announced that **due to extremely low prices at Waha Hub**, it has initiated natural gas volume deferrals at Alpine High. […] While optically we view the release as a negative, **we do not think it is a surprise to the market** that depressed Waha pricing is hampering Alpine cash generative capabilities. [Stephens, 4/23/19, emphasis added]
>
> **Not unexpectedly**, Apache has decided to defer certain natural gas production out of its gas-heavy Alpine High position in the Permian Basin **due to extremely low WAHA hub pricing**. [Scotiabank, 4/23/19, emphasis added]

57. Plaintiffs claim that a "flashnote" issued by analysts at Macquarie on April 23, 2019 is evidence that "[f]inancial media and securities analysts noted the deferral introduced

greater risk and delay at Alpine High."[67] However, in the same "flashnote," Macquarie analysts described the Alpine High natural gas production as "prudent" and "expected" given the weakness of regional gas pricing. Further, the Macquarie analysts reiterated their "neutral" rating of Apache stock and did *not* change their price target.

> Given the severity of **local Permian natural gas pricing weakness**, we think the deferral of gas is **prudent and likely expected by investors**. [Macquarie, 4/23/19, emphasis added]

58. As noted above in Section VI., in an efficient market, stock prices react rapidly to incorporate new information when it is released and do not react in response to known or expected news. The April 23, 2019 announcement of Alpine High production deferral was already expected by the market given the weak Waha Hub natural gas prices. Thus, in an efficient market, no portion of Apache's stock's price reaction following the April 23, 2019 alleged corrective disclosure can be attributed to deferred Alpine High production or the alleged misrepresentations.

<u>The market's expectations about Alpine High's reserves and the mix of oil and wet gas vs. dry gas did not change</u>

59. The April 23, 2019 alleged corrective disclosure did not reveal any new information about the alleged fraud or change the market's expectations about Alpine High's reserves or the mix of oil and wet gas vs. dry gas. Instead, the Company announced a deferral in production in response to the currently "extremely low prices at Waha Hub."

60. Moreover, following the April 23, 2019 alleged corrective disclosure, no analyst attributed the deferral to any revelation regarding Alpine High's quantity or mix of oil and wet gas vs. dry gas. Instead, analysts described Alpine High's production deferral as "shut-ins," which are defined as "available oil or gas which is not being produced from an existing well."[68] In other words, according to analysts, there was available oil or gas at Alpine High but it was not being produced. Analysts noted that the shut-ins at Alpine High were due to the weak commodity price outlook.

> To date, we've already seen **Waha regional gas pricing** ($1.428/Mcf in 1Q19, -$0.29 in 2Q19) **compel shut-ins at Alpine High** for APA, and we suspect that a

[67] Complaint, ¶312.

[68] "Shut-in," *Merriam Webster*, accessed at: https://www.merriam-webster.com/dictionary/shut-in.

> combination of weak pricing and physical constraints should create some near-term noise until pipelines come online in 3Q. [Cowen, 4/26/19, emphasis added]
>
> On Tuesday (4/23/19) APA announced that it initiated **natural gas production volume deferrals (shut-ins) in the Alpine High operating area** starting in late March **due to 'extremely low prices at Waha Hub'** in the Permian Basin. Management will monitor daily natural gas prices and will return shut-in gas to sales when it is profitable [Barclays, 4/28/19, emphasis added]

61. Further, as will be discussed in detail in Section VIII.A, none of the analysts changed their understanding of Alpine High's reserves or mix of oil and wet gas vs. dry gas. For example, Credit Suisse analysts estimated Alpine High's "unbooked reserves" of wet gas, dry gas, and oil throughout the Focus Period.[69] Credit Suisse analysts did not update their estimates of Alpine High's "unbooked reserves" in the week following the April 23, 2019 alleged corrective disclosure. When they updated their estimates on May 2, 2019, there was essentially no change in the estimated quantity or mix of Alpine High's "unbooked reserves" of wet gas, dry gas, and oil.

62. Thus, in sum, the April 23, 2019 alleged corrective disclosure shows no price impact from the alleged misrepresentations for multiple reasons, including that i) there was no statistically significant decline in Apache's stock price following the announcement, ii) the deferral of Alpine High gas production was expected given "extremely low" gas prices and thus in an efficient market could not affect the stock price, and iii) the allegedly corrective information did not change the market's expectations about Alpine High's reserves or the mix of oil and wet gas vs. dry gas.

2. The price decline after the October 25, 2019 alleged corrective disclosure regarding the resignation of Apache's Senior VP of Worldwide Exploration was not related to Alpine High and instead was explicitly attributed to concerns about Apache's Suriname exploration

63. According to Plaintiffs, on October 25, 2019, "media reports revealed that [Apache Senior Vice President of Worldwide Exploration] Keenan had abruptly 'resigned.'"[70] Plaintiffs claim that analysts and the media "easily connected news of Keenan's departure to the

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[69] "Unbooked reserves" reflect the quantity of reserves in a play that are possible and probable, but not proven. See footnote 112 for more detail.

[70] Complaint, ¶¶313-314. See, for example, "Apache: SVP of Worldwide Exploration Steven Keenan Resigned," *Bloomberg*, October 25, 2019.

Alpine High debacle" and that this news was a "partial" alleged corrective disclosure that allegedly caused a decline in Apache's stock price.[71]

64. The October 25, 2019 alleged corrective disclosure shows no price impact from the alleged misrepresentations and no link to the alleged misrepresentations, including for the following reasons, which are detailed below:

a) all analyst commentary following this announcement explicitly attributed Apache's stock price decline on that day to market speculation about Apache's Suriname exploration and not due to any new news about Alpine High; and

b) no new information about Alpine High was revealed.

<u>Analysts attributed stock price decline to Suriname concerns</u>

65. According to both Dr. Nye's event study model and the alternative event study model, there was a statistically significant decline in Apache's stock price on October 25, 2019.[72] While Apache's stock price did decline following the announcement of Mr. Keenan's resignation, which occurred during market hours, analysts attributed the decline in Apache's stock price to concerns about the Company's Suriname exploration and not to any new news about Alpine High.

66. On October 25, 2019, only three analyst reports on Apache were issued. All three analyst reports directly attributed Apache's stock price decline to the market's concerns about Apache's Suriname exploration. None of the analyst reports linked Apache's stock price decline to any new news about Alpine High's oil and wet gas reserves or its mix.

67. The Credit Suisse analyst report issued on October 25, 2019, an analyst report cited in the Complaint,[73] stated that Mr. Keenan's resignation coincided with Apache's drilling in Suriname, and that the Apache's stock price decline on this date highlighted the market's "high expectations" for the Suriname well.

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[71] Complaint, ¶¶313-314.

[72] The media reports were issued during market hours on October 25, 2019 and thus any reaction to the news, in an efficient market, would be expected on October 25, 2019. See, for example, "Apache: SVP of Worldwide Exploration Steven Keenan Resigned," *Bloomberg*, October 25, 2019, 9:44 a.m.

[73] Complaint, ¶314.

> **Timing of resignation is concerning.** While Mr. Keenan's exact role in Suriname is not clear (APA claims the resignation is not connected to the exploration prospect), **APA is underperforming peers** by >5% today given the timing of the departure of the head of Worldwide Exploration when the company is on the 31st day of drilling the **Suriname well**, i.e. is now within the expected 30-60 day spud-to-TD window. **Today's sell-off nonetheless highlights the high expectations for the well** already baked into APA's stock price [...] [Credit Suisse, 10/25/19, emphasis original and added]

68. The RBC Capital Markets analyst report issued on October 25, 2019 stated that Apache's stock price dropped due to investor concern about the Suriname well.

> We think **APA share weakness is a reaction to investor concern that the resignation is related to** the outcome of APA's Maka-1 exploration well in **Suriname**. [RBC Capital Markets, 10/25/19, emphasis added]

69. The Truist Securities analyst report issued on October 25, 2019 indicated that Apache's stock price dropped was linked to speculation about the Suriname well.

> **Apache's stock underperformed this morning** (down ~5.5% vs. XOP up ~1%) **on investor speculation** that a SVP's resignation (See Link) is linked **to an upcoming unsuccessful Suriname** Maka-1 exploration well in Block 58. [Truist Securities, 10/25/19, emphasis added]

70. The October 25, 2019 *Bloomberg* article cited in the Complaint also stated that Mr. Keenan's departure could "fuel concerns" about the Suriname well.[74]

> The geologist's departure may fuel concerns about the fate of Apache's search for Crude in Suriname, adjacent to an Exxon Mobil Corp. discovery that's one of the world's biggest finds in years. ["Apache Executive's Departure Sparks Worst Rout Since 2016," *Bloomberg*, 10/25/19]

71. *None* of the analyst reports or news stories issued on this date attributed the stock price decline to any news about Alpine High, but rather to Suriname exploration concerns, which demonstrates no link between the alleged misrepresentations and Apache's stock price during the Focus Period and no price impact for the October 25, 2019 alleged corrective disclosure due to the alleged misrepresentations.

<u>No new information revealed about Alpine High</u>

72. The October 25, 2019 alleged corrective disclosure revealed no new information about Alpine High. Plaintiffs claim that "[a]nalysts and the mainstream media easily connected

[74] Complaint, ¶314.

news of Keenan's departure to the Alpine High debacle."[75] However, when discussing Mr. Keenan's relationship with Alpine High, analysts and media only repeated known facts about Alpine High, including the effect of weak commodity prices on Alpine High's production. For example, analysts at RBC Capital Markets stated that Mr. Keenan was part of the team that discovered Alpine High and commented that Alpine High results did not meet expectations due to weak natural gas and NGL prices.[76] The effect of weak commodity prices on Alpine High was already known – as an example, on October 7, 2019, analysts at Cowen commented that "given particularly weak NGL pricing and gas pricing, it's likely that APA looks to redeploy capital away from Alpine High[.]"[77]

73. Moreover, as will be discussed in detail in Section VIII.A, none of the analysts changed their understanding of Alpine High's reserves or mix of oil and wet gas vs. dry gas. For example, Credit Suisse analysts estimated Alpine High's "unbooked reserves" of wet gas, dry gas, and oil throughout the Focus Period. Credit Suisse analysts did not change their estimates of Alpine High's "unbooked reserves" after the October 25, 2019 alleged corrective disclosure.[78]

74. Thus, in sum, the October 25, 2019 alleged corrective disclosure shows no price impact from the alleged misrepresentations for multiple reasons, including that i) all analyst commentary following the announcement attributed Apache's stock price decline on that day to market concerns about Apache's Suriname exploration and ii) no new information about Alpine High was revealed.

3. The March 16, 2020 alleged corrective disclosure was in a *Seeking Alpha* article that nobody mentioned, let alone tied to any price drop, and the article revealed no new information about Apache at all

75. Plaintiffs claim that the March 16, 2020 *Seeking Alpha* article disclosed how Alpine High had left Apache "particularly challenged amongst its E&P peers" with high levels of

[75] Complaint, ¶314.

[76] RBC Capital Markets analyst report, dated October 25, 2019 ("Mr. Keenan was a major part of the team that discovered the Alpine High play that has been a significant investment for APA. However, we think the outcome of results from Alpine High have not met high expectations and due to weakening natural gas and NGL prices, we expect that APA could allocate activity away from Alpine high in favor of oilier targets in other parts of the Permian.").

[77] Cowen analyst report, dated October 7, 2019.

[78] See, Credit Suisse analyst reports dated August 1, 2019 and October 31, 2019.

debt.[79] According to Plaintiffs, this announcement allegedly caused Apache's stock price to fall over the next two trading days (March 16 and 17).[80]

76. The March 16, 2020 alleged corrective disclosure shows no price impact from the alleged misrepresentations and no link to the alleged misrepresentations, including for the following reasons, which are detailed below:

a) no analyst or news story mentioned the *Seeking Alpha* article, let alone tied it to any price drop;

b) there was no new news about Apache at all, let alone Alpine High; and

c) both Dr. Nye's event study model and the alternative event study model are not applicable to this date due to increased market volatility

No analyst or news story mentioned the Seeking Alpha article or tied it to any price drop

77. No analyst or news story discussed or even mentioned the *Seeking Alpha* article following the March 16 alleged corrective disclosure, let alone tied it to any drop in Apache's stock price. In particular, a detailed search of analyst reports on Apache from Refinitiv Eikon, the Company, and Dr. Nye's turnover materials, and a detailed search of news stories from Factiva and Bloomberg shows that there was no mention of the March 16, 2020 *Seeking Alpha* article on Apache.

78. Moreover, unlike analyst reports that are issued by professional financial analysts at brokerage firms, *Seeking Alpha* is a provider of crowdsourced content and not a "licensed securities dealer, broker or US investment adviser or investment bank."[81] Sarfaraz A. Khan, the

[79] Complaint, ¶315. See also, "The Oil Price Crash Puts Apache Corporation In A Tough Spot," *Seeking Alpha*, March 16, 2020.

[80] Complaint, ¶316.

[81] "We Are Seeking Alpha," accessed at: https://about.seekingalpha.com/.

author of the at-issue *Seeking Alpha* article, describes himself as a "financial writer and investor,"[82] and there is no indication that Mr. Khan was professionally employed.[83]

79. As discussed above, analysts typically issue reports after new important information about the company is released, and these reports play an important role in disseminating information about a stock and can be a valuable source of information on market knowledge and sentiment at the time. The lack of analyst reports and any news stories mentioning the *Seeking Alpha* article after this date is consistent with the lack of price impact and demonstrates that the *Seeking Alpha* article was not important to the market's valuation of Apache.

<u>No new news about Apache at all, let alone Alpine High</u>

80. Plaintiffs claim that the March 16, 2020 *Seeking Alpha* article disclosed how Alpine High had left Apache "particularly challenged amongst its E&P peers" with high levels of debt.[84] However, contrary to Plaintiffs' claim, the article disclosed no new information about Apache or Alpine High at all. In fact, contrary to Plaintiffs' theory that Alpine High was "too heavy on unprofitable 'dry' gas," the *Seeking Alpha* article described Alpine High as "wet-gas rich."[85] Moreover, as will be discussed in detail in Section VIII.A, no analysts changed their understanding of the reserves or mix of oil and wet gas vs. dry gas at Alpine High.

81. In particular, the information in the *Seeking Alpha* article about Apache's debt that Plaintiffs claim was corrective (and in fact, the only part of the article Plaintiffs claim was corrective) was not new news. As noted above in Section VI., in an efficient market, stock prices react rapidly to incorporate new information when it is released and do not react in response known or expected news.

82. Plaintiffs claim that the article revealed that Apache did not have a "strong balance sheet" with "high levels of debt" of over $8 billion in 2019, and a "lofty debt-to-equity

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82 Profile page of Sarfaraz A. Khan on *Seeking Alpha*, accessed at: https://seekingalpha.com/author/sarfaraz-a-khan.

83 Profile page of Sarfaraz A. Khan on *LinkedIn*, accessed at: https://www.linkedin.com/in/sarfaraz-khan-61012b34/.

84 Complaint, ¶315.

85 "The Oil Price Crash Puts Apache Corporation In A Tough Spot," *Seeking Alpha*, March 16, 2020.

ratio of almost 250% - the highest among all large-cap independent oil producers."[86] However, all of this information was publicly available and known *before* the *Seeking Alpha* article was published and was thus not new news.

83. First, information about Apache's $8 billion debt and equity as of 2019 that the *Seeking Alpha* article used to calculate the "debt-to-equity ratio of almost 250%" was released to the market as part of Apache's 4Q19 and FY2019 financial results on February 26, 2020 after market close.[87] There was a statistically significant increase in Apache's stock price on this date according to Dr. Nye's event study model and the alternative event study model.

84. Second, many analysts had examined Apache and other E&P companies' debt before the *Seeking Alpha* article was published. For example, a Cowen analyst report on the E&P industry on March 11, 2020 listed the debt amount and maturity terms of Apache and other E&P companies.[88] As another example, a JP Morgan analyst report on March 2, 2020 explicitly listed its calculation of Apache's debt-to-equity ratio as of 2019.[89]

85. Moreover, analysts had discussed Apache's debt situation, before the alleged corrective disclosure and expressed no concern about Apache's solvency. For example:

> Liquidity remains ample in our view, with $247mm of cash on hand, ~$4.0bn of total revolver capacity, and $293mm of debt maturing in the next 18 months. [JP Morgan, 2/27/20]
>
> APA has **plenty of liquidity** with a fully undrawn $4bn unsecured revolver & only ~$293MM/$463MM of 2021/22 debt maturities. [Credit Suisse, 3/12/20, emphasis added]
>
> Apache currently has a $4Bn undrawn revolver and sees **ample flexibility** in addressing $937MM in maturities coming due between Feb 2021 and Jan 2023. [Truist Securities, 3/12/20, emphasis added]

86. Contrary to Plaintiffs' claim, the *Seeking Alpha* article stated that the primary reason for Apache's financial stress was plummeting commodity prices caused by the Covid

[86] Complaint, ¶315.

[87] "Apache Corporation Announces Fourth-Quarter and Full-Year 2019 Financial and Operational Results," *Apache Press Release*, February 26, 2020.

[88] Cowen analyst report on E&P industry, dated March 11, 2020. See also, Scotiabank analyst report on Apache, dated February 28, 2020.

[89] JP Morgan analyst report on Apache, dated March 2, 2020.

pandemic.[90] In fact the title of the article "The Oil Crash Puts Apache Corporation In A Tough Spot" highlights that the focus of the article is the collapse in oil prices rather than any information about Alpine High. Further, the *Seeking Alpha* article itself concluded that Apache would have ample time to prepare for the maturities of its debt even with the plummeting commodity prices:

> The good thing, however, is that Apache doesn't have any significant (>$500 million) near-term debt maturities. The company has a total of $937 million near-term debt which becomes due between 2021 and 2023 […] A vast majority of its total debt matures after 2024. I think **the company has ample time to devise a plan to shore up its finances**, mainly through the sale of non-core assets. ["The Oil Price Crash Puts Apache Corporation in a Tough Spot," *Seeking Alpha*, 3/16/20, emphasis added]

87. Moreover, as will be discussed in detail in Section VIII.A, none of the analysts changed their understanding of Alpine High's reserves or mix of oil and wet gas vs. dry gas. For example, Credit Suisse analysts estimated Alpine High's "unbooked reserves" of wet gas, dry gas, and oil throughout the Focus Period. Credit Suisse analysts did not decrease their estimates of Alpine High's "unbooked reserves" after the March 16, 2020 alleged corrective disclosure.[91]

Both Dr. Nye's event study model and the alternative event study model are not applicable to this date due to increased market volatility

88. The Covid pandemic, along with the oil price war between Saudi Arabia and Russia, caused significant market uncertainty during March 2020.[92] Dr. Nye's event study model and the alternative event study model do not account for this increased market volatility starting in March 2020 and are not applicable to the March 16, 2020 alleged corrective disclosure. However, given that the March 16, 2020 alleged corrective disclosure revealed no new information about Alpine High and that nobody mentioned the article, an adjustment to either event study model to account for increased market volatility would not be necessary. To the extent that there was any price reaction, there can be no link to the alleged fraud, given that there

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[90] "The Oil Price Crash Puts Apache Corporation In A Tough Spot," *Seeking Alpha*, March 16, 2020.

[91] See, Credit Suisse analyst reports dated February 27, 2020 and May 7, 2020.

[92] See, for example, "Dow Jones Today, Bear Market Worsens On Trump Response To Coronavirus Pandemic; Boeing Shares Collapse," *Investor's Business Daily*, March 12, 2020 ("Stocks ripped into new bear market lows Thursday, with Dow Jones industrials diving more than 2,000 points, after a Wednesday night speech from President Donald Trump ramped up the U.S. response to the coronavirus pandemic. Travel, transport and oil stocks were among the hardest hit in broad early selling.").

was no new news about Alpine High (or Apache) in the *Seeking Alpha* article and no analyst or news story even mentioned the *Seeking Alpha* article.[93]

89. Specifically, in March 2020, oil prices began to decline due to sudden and unprecedented events, including an oil price war between Saudi Arabia and Russia that unexpectedly increased oil supply and the imposition of stay-at-home orders in response to the Covid pandemic which caused oil demand to plummet. Throughout the Focus Period, oil made up around 80% of Apache's production revenue, with around 40% coming from the U.S. and the rest from Egypt and the North Sea.[94] Apache was thus exposed to both international and U.S. oil pricing. The chart below shows the movements of the Brent Global ("Brent") and the West Texas Intermediate ("WTI") Crude Oil spot prices, two commonly used benchmarks for international and U.S. oil pricing respectively,[95] in relation to select events relevant to the dramatic oil price changes in March 2020.[96]

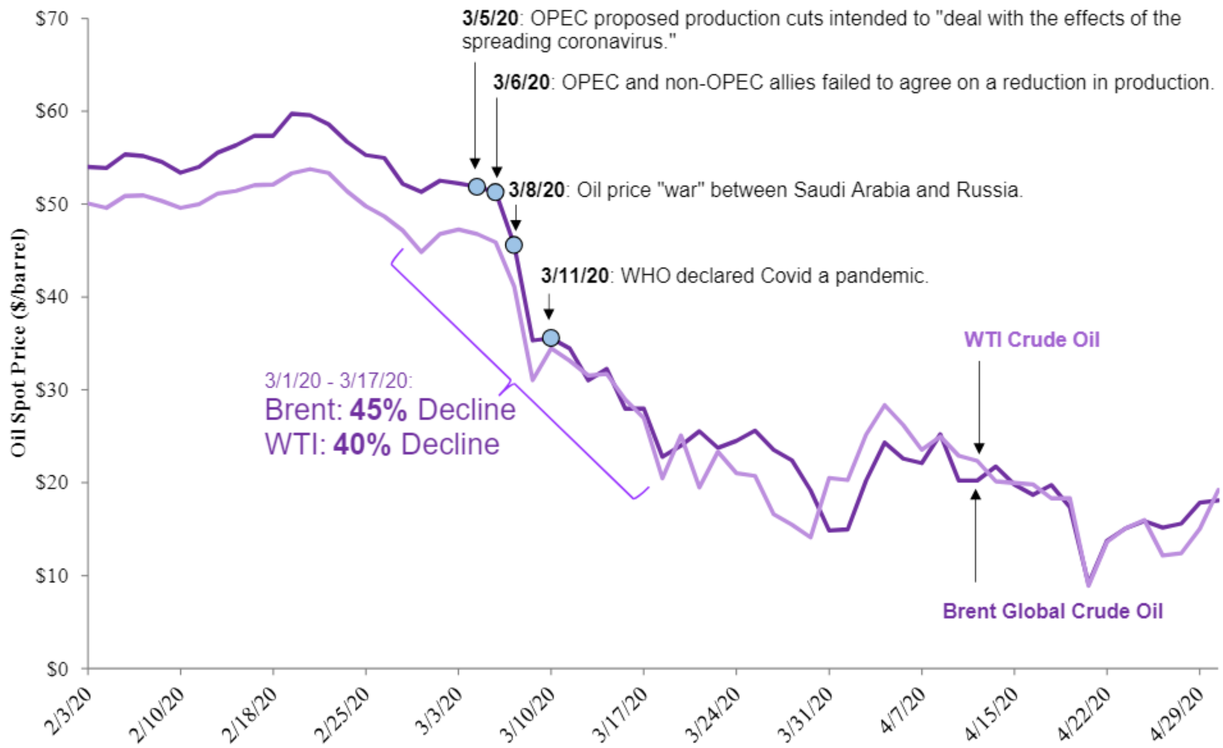
[93] The article was released before the market opened on March 16, 2020 and thus any reaction to the news, in an efficient market, would be expected on March 16, 2020. See, "The Oil Price Crash Puts Apache Corporation In A Tough Spot," *Seeking Alpha*, March 16, 2020, 3:35 a.m.

[94] From 2018 to 2020, approximately 80% of Apache's total production revenue was made up of oil production. Apache FY20 Form 10-K, filed February 26, 2021, p.36.

[95] See, for example, "Energy Investing Basics: WTI vs. Brent Crude Oil," *Charles Schwab*, February 22, 2023; see also, Apache FY20 Form 10-K, filed February 26, 2021, pp. 6, 38, 43.

[96] Note David Sullivan, former Executive Director at Lead Plaintiff Plymouth County Retirement Systems, testified that March 2020 was a time period of dramatic fluctuations in the market. See, Sullivan Deposition, 73:2-8 ("Q. And what do you mean by "unusual fluctuations in the market as a whole"? A. That the, you know, case of March of 2020, the decreases and the subsequent increases were just, you know, more dramatic than, you know, other periods – or normal periods of time.").

Oil Price Benchmarks
Brent Global and WTI Crude Oil Spot Prices



Notes and Sources:
Data from FactSet Research Systems, Inc. and news articles. WTI Crude Oil Spot Price set to previous day's price on April 20, 2020 to eliminate negative price on that day.

90. As the chart shows, by March 17, 2020 (the last day Plaintiffs allege Apache's stock price declined as a result of the alleged corrective disclosures), oil prices had declined by more than 40% in just two weeks. Further, by the end of March 2020, the WTI and Brent Crude Oil spot prices had declined by approximately 70% from the beginning of March.[97] Some of the key dates and events during this unprecedented time period include:

- Early 2020: Covid and associated shutdowns caused economic disruption and reduced demand for oil (especially in China, one of the world's largest oil importers).[98]

[97] Based on data from FactSet Research Systems, Inc.

[98] "Why oil prices are crashing and what it means," *CNN*, March 9, 2020. ("The coronavirus has undermined energy demand worldwide, but especially in China, which is now the number one importer of crude oil, guzzling roughly 10 million barrels a day. Factories have been idled and thousands of flights canceled around the world as the coronavirus outbreak that began in Wuhan, China, has become a global pandemic. The International Energy Agency said Monday that it expects demand will contract this year for the first time since the recession in 2009 that followed the global financial crisis."). See also, "The Coronavirus Crash Of 2020, And The Investing Lesson It Taught Us," *Forbes*, February 11, 2021. ("As the pandemic began [its] spread in March and

- March 5, 2020: The Organization of the Petroleum Exporting Countries ("OPEC") proposed production cuts, intending to "deal with the effects of the spreading coronavirus on demand."[99]

- March 6, 2020: OPEC and non-OPEC allies failed to agree on a reduction in production as Saudi Arabia could not convince Russia to commit to deeper supply cuts.[100]

- March 8, 2020: Saudi Arabia cut its oil prices, setting off a price war on oil with Russia.[101] When U.S. markets opened on March 9, "U.S. crude oil tumbled from $41 a barrel to around $30 in a matter of minutes, going on to post its biggest one-day drop since the first Gulf War in 1991."[102]

- March 11, 2020: The World Health Organization ("WHO") declared Covid a pandemic.[103]

91. News articles published at the end of March 2020 illustrate the extreme impacts that these events had on global oil markets over that month:

government officials around the world shutdown economic activity, panic triggered by the economic consequences and uncertainty led to a stock market crash that included the three worst point drops in U.S. history. [...] Between Feb. 12 and March 23, the Dow lost 37% of its value. By [the] middle of March, panic was rising. As the US went into lockdown mode, over 20 million jobs were lost, businesses closed and the virus continued [its] spread. Investors watched as their retirement savings lost 30% in two weeks, and speculation about how bad it could get created even more fear among investors.").

[99] "OPEC Proposes a Large Cut in Oil Output," *The New York Times*, March 5, 2020.

[100] "After a Long Fall in Oil Prices, a Crash," *The Wall Street Journal Online*, March 15, 2020. See also, "OPEC+ fails to agree on massive supply cut, sending crude prices to 2017 lows," *CNBC*, March 6, 2020. ("OPEC and non-OPEC allies failed on Friday to agree on how much oil production to cut amid the coronavirus outbreak, with Russia reportedly refusing to give the green light to the deepest supply cuts since the global financial crisis. Oil prices initially slipped Friday afternoon on reports that Moscow said it wasn't prepared to approve a further reduction in production. Later, Reuters also reported that OPEC and its allies had even failed to agree on rolling over existing cuts, further weighing on crude prices. Then a statement by the oil group said it would continue discussions and made no mention of any cuts.").

[101] "Oil nose-dives as Saudi Arabia and Russia set off 'scorched earth' price war," *CNBC*, March 8, 2020. ("Oil prices fell through the floor in early trading Monday, tanking as much as 30% after Saudi Arabia slashed its crude prices for buyers. The kingdom is reportedly preparing to open the taps in an apparent retaliation for Russia's unwillingness to cut its own output.").

[102] "After a Long Fall in Oil Prices, a Crash," *The Wall Street Journal Online*, March 15, 2020.

[103] "WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020," *World Health Organization*, March 11, 2020.

> Saudi Arabia launched the offensive at the beginning of the month after Russia, its partner in the so-called Opec+ alliance, refused to join in making deeper cuts to crude production to support prices. **In response, the kingdom has said it will open the taps to demonstrate its power in the market. But the decision was made before it became clear how badly coronavirus would hit global demand**, raising hopes Saudi Arabia can be convinced to alter its stance — even as it remains at odds with Russia over how to respond to the crisis. One Saudi source familiar with the kingdom's energy policy conceded the collapse in oil demand — now estimated at being between 10 per cent and 25 per cent of the 100m barrel a day global market — had far exceeded their projections in early March, before the start of widespread lockdowns and flight cancellations. **The global oil industry is now facing the prospect of running out of storage in a matter of weeks as the most severe demand slump in history coincides with rising supplies**. ["US puts pressure on Saudi Arabia to end oil price war," *Financial Times*, March 25, 2020, emphasis added]
>
> **The global oil industry is facing its biggest demand drop in history**, with traders and analysts forecasting crude consumption could fall as much as a quarter next month because of widespread lockdowns across the western world as the pandemic spreads. […] **Oil prices have fallen more than half in the past month as widespread lockdowns in Europe and North America have slashed oil demand. While demand has collapsed, the supply of oil has also increased rapidly because of the price war between Saudi Arabia and Russia**. Saudi Arabia on Monday said it planned to raise exports even further, as its own domestic consumption drops during the pandemic. ["US crude oil price falls below $20," *Financial Times*, March 30, 2020, emphasis added]

92. As a result of the dramatic oil price decline, many E&P companies, including Apache, announced a reduction in planned capital expenditure, a reduction in drilling and production activities, and dividend cuts to protect their balance sheets, which analysts considered "prudent."[104] The March 16, 2020 *Seeking Alpha* that Plaintiffs allege as a corrective disclosure article also discussed Apache's dividend cut, stating that it was "a step in the right direction" and will "soften the blow coming from weak oil, gas and NGL prices."[105]

93. As a result of the unprecedented events described above, volatility in the market dramatically increased around the March 16, 2020 alleged corrective disclosure. For example, as shown in the chart below, the Chicago Board Options Exchange's CBOE Volatility Index (the "VIX Index"), a commonly used measure of the stock market's expectation of volatility based on

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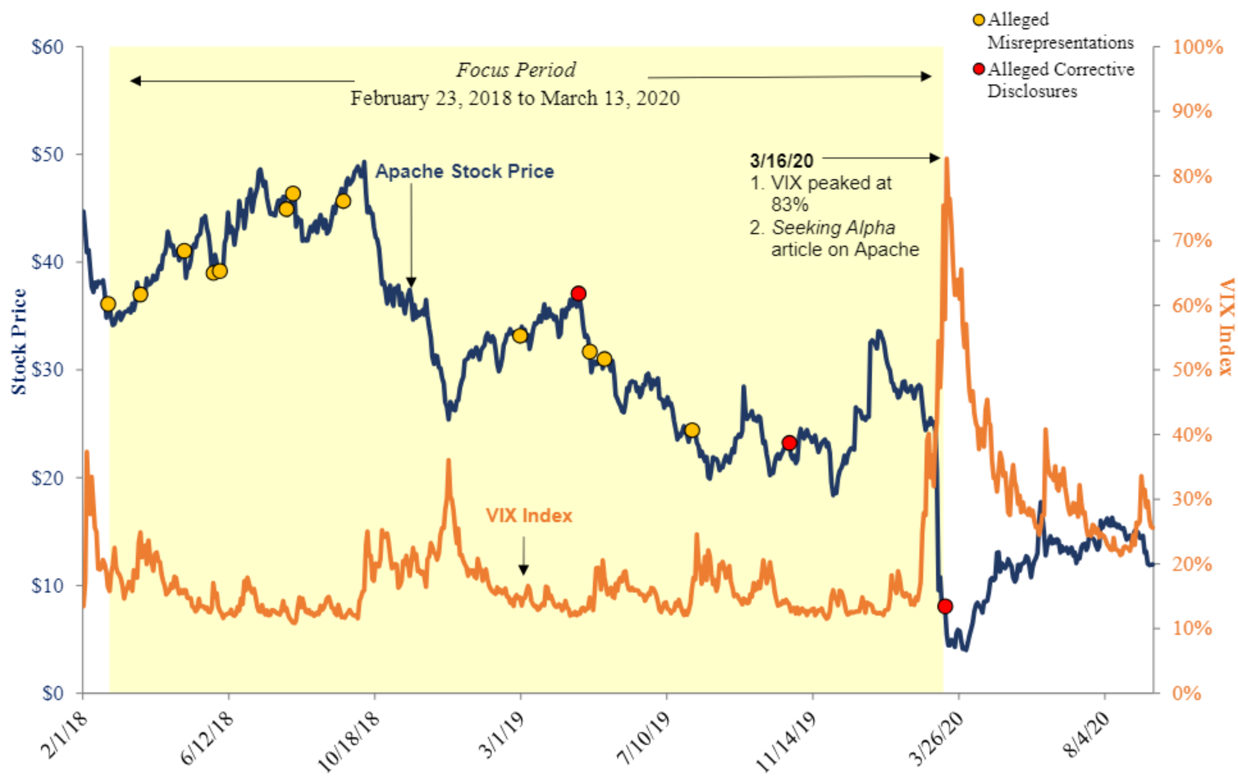
[104] See, for example, Stephens analyst report on Apache, dated March 12, 2020 ("We believe the dividend cut is prudent based on current commodity outlook.") and Credit Suisse analyst report on the E&P industry, dated March 12, 2020 ("Nine of the 33 E&Ps in our coverage have now officially announced spending/activity reductions this week[.]").

[105] "The Oil Price Crash Puts Apache Corporation In A Tough Spot," *Seeking Alpha*, March 16, 2020.

S&P 500 index options, peaked on March 16, 2020 at 83%, approximately 5 times its average value from February 23, 2018 to February 28, 2020.[106]

Apache Stock Price and Market Implied Volatility (VIX)



Notes and Sources:
Data from Bloomberg, L.P. Events from the Complaint.

94. Dr. Nye does not even discuss how the heightened market volatility in March 2020 would affect interpretations of his event study results, even though he appears to find that on every day around the March 16, 2020 alleged corrective disclosure, Apache's stock had a statistically significant price reaction. As discussed above, the test of the statistical significance of a price reaction is based on the range of normal expected daily variation in stock prices. When testing the statistical significance of the price reaction on a certain date, both Dr. Nye's event study model and the alternative event study model use an estimation period of a year before this date, thereby using the stock price volatility in the year before this date to estimate the range of normal expected daily variation in Apache's stock on this date. The Complaint attributes the movement in Apache's stock price during the two-day period from March 16 to March 17, 2020

[106] "Cboe VIX Index," *Cboe*, accessed at: https://www.cboe.com/tradable_products/vix/.

to the alleged corrective information. However, due to the heightened market volatility, price movements of Apache's stock around March 16, 2020 were substantially different from what would be expected given the company's stock price movements in the prior year, when market volatility was much lower. By not accounting for increased market volatility, both Dr. Nye's event study model and the alternative event study model appear to find statistically significant reactions around this time period even when there is no new company-specific news, demonstrating that these event study models are not applicable to the March 16, 2020 alleged corrective disclosure.

95. An analysis of the stock price movement of Apache and constituents of Dr. Nye's industry index, using Dr. Nye's event study model, shows that from March 12 to March 18, 2020,[107] the majority of companies appear to have statistically significant reactions even when there is no new company-specific news.[108] The table below shows that 64% of companies had a statistically significant price reaction on March 12 and 13, 73% on March 16, and 82% on March 17 and 18, 2020. Moreover, according to Dr. Nye's event study model, Apache's excess returns on every day from March 12 to March 18, 2020 were statistically significant at the 1% significance level, despite the fact that there was no Company-specific news from March 12 to March 18, 2020 except for Apache's March 12, 2020 announcement of a dividend cut, which was consistent with the E&P industry's capital expenditure cuts and was considered "prudent."[109] This further shows that the range of normal expected daily variation in stock prices during a period of low market volatility is not applicable to testing stock price movements during a period of heightened market volatility.

[107] From March 12 to March 18, 2020, Apache and all constituents of Dr. Nye's industry index constituted the S&P 500 Oil & Gas Exploration and Production Index.

[108] A review of news articles on Factiva on all 10 constituents of Dr. Nye's industry index and Apache from March 12, 2020 to March 18, 2020 indicates that news was primarily focused on capital expenditure cuts by E&P companies, an industry-wide occurrence.

[109] See, for example, Stephens analyst report on Apache, dated March 12, 2020 ("We believe the dividend cut is prudent based on current commodity outlook.") and Credit Suisse analyst report on the E&P industry, dated March 12, 2020 ("Nine of the 33 E&Ps in our coverage have now officially announced spending/activity reductions this week").

Summary of Statistically Significant Price Reactions of Apache and Constituents of Nye's Industry Index From March 12, 2020 to March 18, 2020

Using Nye's Event Study Methodology

	Statistically Significant Reaction?				
Company	3/12/20	3/13/20	3/16/20	3/17/20	3/18/20
(1)	(2)	(3)	(4)	(5)	(6)
1. **Apache Corp**	✓	✓	✓	✓	✓
2. Devon Energy Corporation	✓	✓	✓	✓	✓
3. EOG Resources, Inc.	✓	✓	✓	✓	✓
4. Noble Energy, Inc.			✓	✓	✓
5. Cabot Oil & Gas Corp[1]		✓		✓	
6. Pioneer Natural Resources Co.			✓	✓	✓
7. Marathon Oil Corporation	✓		✓	✓	✓
8. ConocoPhillips	✓		✓		✓
9. Hess Corporation	✓	✓	✓		✓
10. Concho Resources Inc.		✓		✓	
11. Diamondback Energy, Inc.	✓	✓		✓	✓
No of Cos. with Stat.Sig. Rxn:	7	7	8	9	9
% of Cos. with Stat.Sig. Rxn:	64%	64%	73%	82%	82%
Majority of Cos. with Stat.Sig. Rxn?:	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

Notes and Sources:

Data from "NYE_00000001.xlsx" and "NYE_00003032.xlsx."

Returns are predicted using daily percent returns of the companies as a function of the daily percent returns of S&P 500 Index and an industry index regressed over a control period that is the calendar year immediately preceding the date. Consistent with Dr. Nye's methodology, control period for March 16, 2020 and onwards is March 14, 2019 to March 13, 2020. The industry index for each constituent is calculated using Dr. Nye's methodology, by weighing the returns of all constituents except itself, by their market capitalization on the previous day.

Excess return's significance is based on the excess return's t-statistic, calculated as the daily excess return divided by the standard error of the regression over the control period. ✓ indicates significance at the 5% level.

Only companies that were a part of the S5OILP Index between March 12, 2020 to March 18, 2020 are considered.

[1] Cabot Oil & Gas Corporation merged with Cimarex Energy on October 1, 2021 to form Coterra Energy, Inc. Cabot's former ticker COG was replaced by CTRA.

96. Thus, in sum, the March 16, 2020 alleged corrective disclosure shows no price impact from the alleged misrepresentations for multiple reasons, including that i) nobody ever mentioned the *Seeking Alpha* article or tied it to any price drop (to the extent there was one) , ii)

there was no new news about Apache at all, let alone Alpine High, and iii) both Dr. Nye's event study model and the alternative event study model are not applicable to test stock price reactions around this date, as a result of heightened market volatility due to Covid.

VIII. A Big Picture Analysis Is Consistent with No Price Impact During the Focus Period – the Market Did Not Change Its View about Alpine High's Oil and Wet Gas Reserves, Apache's Stock Moved In-Line with the E&P Industry, and the Downward Changes in Expectations about Alpine High Were Driven By Deteriorating Commodity Prices

A. During the Focus Period, the market did not change its view about Alpine High's oil and wet gas reserves or the mix

97. Plaintiffs allege that Apache concealed that "the Alpine High area was too heavy on unprofitable 'dry' gas and too light on valuable oil and 'wet' gas" and claim that the "truth" regarding the alleged misrepresentations was disclosed through a series of partial alleged corrective disclosures.[110] However, Plaintiffs' own Complaint shows that no new information about Alpine High's oil and wet gas reserves or its mix was disclosed after February 23, 2018, the beginning of the Focus Period. In particular, as discussed in detail in Section VII.B above, an analysis of each alleged corrective disclosure during the Focus Period shows that there was no change in the market's expectations about Alpine High's reserves or the mix of oil and wet gas vs. dry gas. Instead, the Company disclosed a deferral of gas production at Alpine High, which was expected by the market by the time the announcement was made given the weak commodity price outlook.

98. Consistent with this lack of new information, analysts' estimates of the quantity of oil and wet gas reserves at Alpine High and its mix were essentially unchanged during the Focus Period.[111] For example, analysts at Credit Suisse estimated Alpine High's "unbooked

[110] Complaint, ¶¶4, 303, 319.

[111] Note that analysts at Cowen estimated Alpine High's wet gas, oil, and dry gas "risked potential" throughout the Focus Period. According to Cowen analysts, "risked potential" is the estimated potential quantity of resources in a play accounting for the development risk and commercial success probability and reflects the commodity price outlook. While Cowen's estimates of the "risked potential" at Alpine High generally decreased during the Focus Period, this change was due to the change in commodity prices, as Cowen analysts did not associate the changes

reserves" of oil, wet gas, and dry gas during the Focus Period. Credit Suisse estimated "unbooked reserves" of numerous E&P companies' plays to reflect the quantity of reserves in a play that are possible and probable, but not proven.[112] As summarized in the chart below, Credit Suisse essentially did not change their estimates of Alpine High's "unbooked reserves" of oil, wet gas, and dry gas or its mix after any of the alleged misrepresentations or alleged corrective disclosures during the Focus Period. As shown in the chart, throughout the Focus Period, Credit Suisse analysts estimated that Alpine High had approximately 5200MMboe (million barrels of oil equivalent) of unbooked wet gas reserves, approximately 2200MMboe of unbooked dry gas reserves, and slightly more than 200MMboe of oil reserves, implying that the estimated wet gas, dry gas, and oil ratios of the unbooked reserves were around 68%, 29%, and 3% respectively. Further, after the end of the alleged Class Period and Focus Period, Credit Suisse continued to maintain essentially the same reserve estimates and mix for Alpine High. Thus, during the Focus Period, Credit Suisse analysts did not change their estimates of the quantity and mix of Alpine High reserves after any of the alleged misrepresentations or alleged corrective disclosures.

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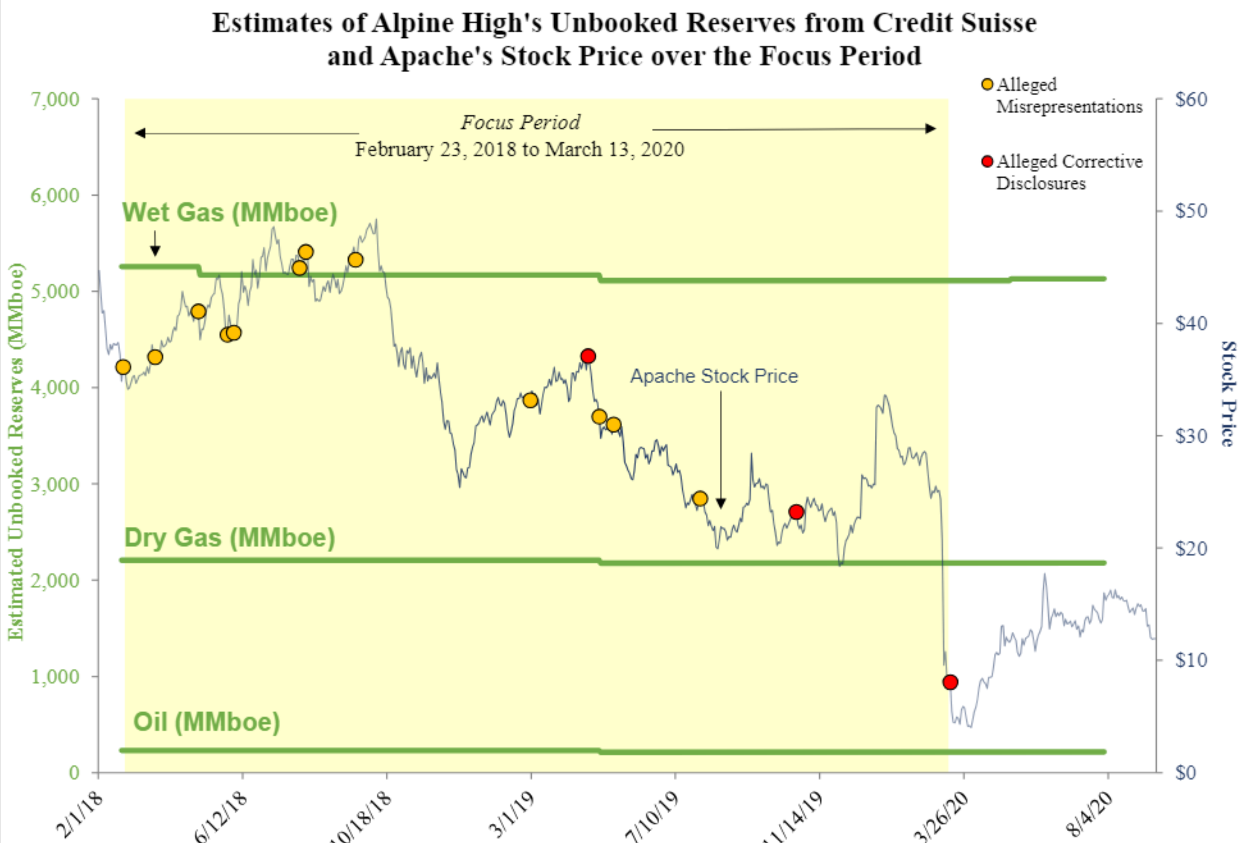
in their "risked potential" estimates to any alleged corrective events or Alpine High's lack of oil and wet gas reserves. Moreover, during the Focus Period, there was essentially no change in Cowen's estimates of the mix of oil, wet gas, and dry gas in Alpine High's "risked potential." Based on information from David Deckelbaum and Gabe Daoud, Managing Directors of Sustainability & Energy Transition at Cowen and part of the analyst team covering Apache.

[112] Based on information from William Featherston, Americas Director of Securities Research at Credit Suisse and part of the analyst team covering Apache. "Proved reserves" are estimated reserves where there is at least a 90% probability that quantities recovered will equal or exceed the estimate. "Probable reserves" are those reserves where there is at least a 50% probability that quantities recovered will equal or exceed the estimate. "Possible reserves" are those reserves where there is at least a 10% probability that quantities recovered will equal or exceed the estimate. See, "Petroleum Reserves Definitions [1997 Archive]," *Society of Petroleum Engineers*, accessed at: https://www.spe.org/en/industry/petroleum-reserves-definitions/. See, also, for example, Credit Suisse analyst report on Cimarex Energy Co., dated June 1, 2017.



Notes and Sources:
Data from Bloomberg, L.P. and Credit Suisse analyst reports. Events from the Complaint.

99. In addition, throughout the Focus Period, analysts at Credit Suisse repeatedly described Alpine High as a "gas-rich" play and estimated that Alpine High had over 4,000 unbooked drilling locations.[113] For example, in its October 31, 2019 analyst report, Credit Suisse stated that Apache's Alpine High acreage was "primarily in the wet gas play" and that there were an estimated "4,000 unbooked drilling locations:"

> APA holds a total of ~300,000 net acres in the Alpine High (primarily in the wet gas play), which we estimate adds >4,000 net unbooked drilling locations and >7 BBoe of net resource potential[.] [Credit Suisse, 10/31/19]

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113 The last Credit Suisse analyst report issued during the Focus Period that commented on Alpine High's reserve quantity or mix was on February 27, 2020. See, for example, Credit Suisse analyst report, dated May 3, 2018 ("However, this growth is primarily attributable to its production from the nascent, gas-rich Alpine High play in the Delaware Basin."), Credit Suisse analyst report, dated November 1, 2018 ("Longer-term growth underpinned by gas/NGL-weighted Alpine High play,"), and Credit Suisse analyst report, dated February 27, 2020 ("[I]n the Alpine High (primarily in the wet gas play),").

Credit Suisse stated substantially similar information in analyst reports issued on November 1, 2018, February 28, 2019, May 2, 2019, August 1, 2019, October 31, 2019, and February 27, 2020.

100. Similarly, a systematic review of analyst reports indicates that no analysts changed their understanding about Alpine High's quantity of wet gas and oil reserves or its oil and wet gas vs. dry gas reserve mix during the Focus Period. In particular, a systematic review of commentary of analyst reports issued after the alleged misrepresentations and alleged corrective disclosures during the Focus Period found no analyst discussion regarding any allegedly corrective information about the quantity or mix of Alpine High's reserves.[114] Instead, analysts repeatedly characterized Alpine High as a *gas-weighted, NGL-rich* play during the Focus Period.

101. The table below summarizes a few examples of analysts' consistent commentary on the quantity and mix of Alpine High's reserves during the Focus Period. As shown in the table, during the Focus Period, analysts at Bank of America consistently described Alpine High's as a "gas play," JP Morgan analysts repeatedly commented on the "gassier mix" of Alpine High, and Morgan Stanley and MUFG analysts repeatedly characterized Alpine High as "NGL-rich." Further, UBS analysts described Alpine High as "gas-weighted" early in the Focus Period in March 2018, consistently stated that Alpine High "predominantly produced NGL and natural gas" more than a year later in August 2019 and continued to estimate that Alpine High had more than 3,500 wet gas drilling locations in December 2019, close to the end of the Focus Period.

Period	Bank of America	JP Morgan	Morgan Stanley	MUFG	UBS
Focus Period Start					
2/23/18 - 4/22/19	8/2/18: Adj. production of 390 mboepd topped guidance of 383 mboepd on strong US output which at 255.5 mboepd beat 248 mboepd guidance, **but mainly gas in the Alpine high**	3/12/18: [T]he company's **growth will be driven by the gassier mix of Alpine High.** 4/27/18: [T]he company's **growth will be driven by the gassier mix of Alpine High.**	8/2/18: Despite strong **Alpine High guidance the gassy product on profile** screens poorly relative to our bearish long-term view of gas.	2/26/18: Going into 2018, production looks poised to benefit from these investments with **particular focus being paid to the Alpine High's NGL-rich 340,000 net acres.**	3/6/18: While we believe that Alpine High can drive ~7% per annum companywide growth in 2018-2020, **the growth is gas weighted** causing APA's cash flow per debt adjusted shares to lag peers.

[114] Based on available analyst reports from Refinitiv Eikon and the Company.

Period	Bank of America	JP Morgan	Morgan Stanley	MUFG	UBS
		6/13/18: Repeat 7/23/18: Repeat 8/20/18: Repeat 10/19/18: Repeat 11/19/18: Repeat 2/27/19: Repeat			5/2/18: Repeat
April 23, 2019 Alleged Corrective Disclosure					
4/23/19 - 10/24/19	10/18/19: Our principal argument has been anchored on a challenged macro view on US natural gas and what has been APA management's wholesale pivot to the **Alpine high gas play as the principal driver of its growth outlook.** 10/22/19: Repeat	4/29/19: [T]he company's **growth will be driven by the gassier mix of Alpine High.** 7/12/19: Repeat 7/22/19: Repeat 8/22/19: Repeat 10/14/19: Repeat	No commentary on reserve quantity/mix.	7/19/19: The company has a fair amount of geographic diversity and has historically been an oil producer. **Its focus on Alpine High exposes the equity to greater commodity risk as it is more of a NGL play**. 8/2/19: Repeat	8/5/19: Base (US$21): Our base case assumes the UBS price deck. **Alpine High continues to predominantly produce NGLs and natural gas**, location of production continues to drive low price realizations.
October 25, 2019 Alleged Corrective Disclosure					
10/25/19 - 3/13/20 (end of Focus Period)	10/31/19: Our principal argument has been anchored on a challenged macro view on US natural gas and what has been APA management's wholesale pivot to the **Alpine high gas play as the principal driver of its growth outlook.** 12/9/19: Repeat	No commentary on reserve quantity/mix.	10/29/19: APA placed a large portfolio emphasis on **Alpine High, an NGL rich, gas weighted play** located in the southwest portion of Reeves county in the Delaware section of the Permian Basin. 1/8/20: Repeat	10/28/19: The company has a fair amount of geographic diversity and has historically been an oil producer. **Its focus on Alpine High exposes the equity to greater commodity risk as it is more of a NGL play**.	12/18/19: Figure 9 of the report shows UBS estimates of more than 3,500 wet gas drilling locations at Alpine High.

Period	Bank of America	JP Morgan	Morgan Stanley	MUFG	UBS
	2/26/20: Investment Rationale Significant discovery offshore Suriname resets the investment case for Apache from **Alpine High natural gas leverage** to deepwater oil exploration and development.				
Focus Period End *March 16, 2020 Alleged Corrective Disclosure*					

102. In sum, as demonstrated by a systematic review of analysts' estimates and descriptions of the quantity and mix of Alpine High's reserves, there was no change in the market's expectations about Alpine High's reserves or the mix of oil and wet gas vs. dry gas. Instead, throughout the Focus Period, analysts maintained their view that Alpine High was a gas-weighted, NGL-rich play.

B. Instead, Apache's stock moved in-line with the oil and gas exploration and production industry

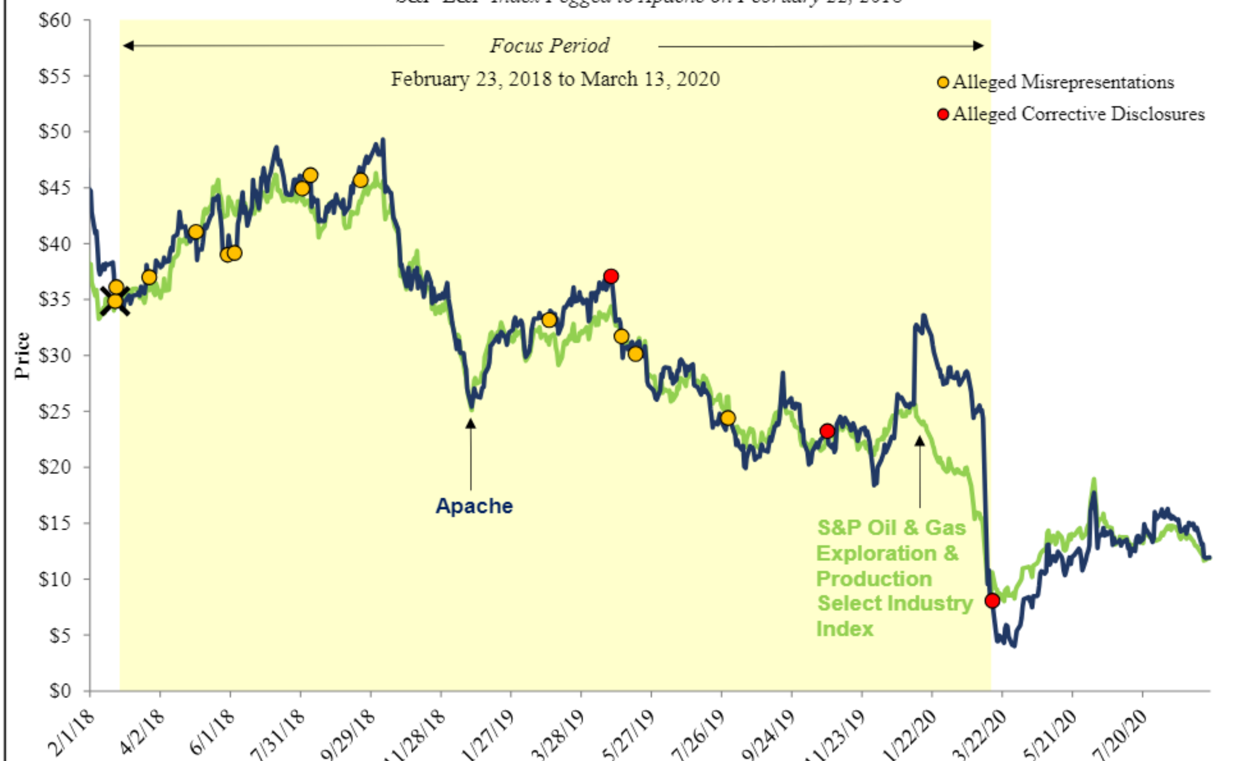
103. Plaintiffs claim that the alleged misrepresentations "created and/or maintained artificial inflation in the price of Apache common stock" and that when the truth "gradually became apparent to the market, the price of Apache common stock fell precipitously," as the alleged inflation "dissipated."[115] However, as shown above in Sections VII.B and VIII.A, during the Focus Period, there was no price reaction from any allegedly corrective information and no change in the market's expectations about Alpine High's reserves or the mix of oil and wet gas vs. dry gas. Instead, Apache's stock moved in-line with the E&P industry during the Focus Period.

[115] Complaint, ¶301.

104. For example, Apache's stock moved in-line with the S&P E&P Index during the Focus Period. The S&P E&P Index is comprised of all stocks in the oil and gas exploration and production sub-industry according to Global Industry Classification Standard ("GICS").[116] During the Focus Period, Apache was a constituent of this index, with its weight in the index ranging from approximately 2% to 4%.[117] As shown in the graph below, Apache's stock price and the S&P E&P Index (excluding Apache) moved in tandem from February 23, 2018, the beginning of the Focus Period, through the end of the alleged Class Period, both increasing through 3Q18 and then decreasing through the end of the Focus Period.

S&P Oil & Gas Exploration & Production Select Industry Index and Apache Stock Price

S&P E&P Index Pegged to Apache on February 22, 2018



Notes and Sources:
Data from Bloomberg, L.P. Events from the Complaint. The S&P Oil & Gas Exploration & Production Select Industry Index returns exclude those of Apache.

105. Moreover, Apache's stock price also moved in-line with oil prices during the Focus Period. As discussed earlier in Section VII.B.3, throughout the Focus Period, oil made up

[116] "S&P Oil & Gas Exploration & Production Select Industry Index Factsheet," *S&P Dow Jones Indices*, as of April 28, 2023.

[117] Based on data from Bloomberg, L.P.

around 80% of Apache's production revenue, with around 40% coming from the U.S. and the rest from Egypt and the North Sea, thus exposing Apache to both international and U.S. oil pricing.[118] In particular, at the end of the Focus Period in March 2020, Apache's stock price, Brent Crude Oil spot price, and WTI Crude Oil spot price plummeted in tandem, as the Covid pandemic caused a series of events that resulted in an oil price collapse.

106. As will be discussed and shown in Section VIII.C, Apache's stock price also moved in-line with prices of NGL and natural gas – two important outputs of Alpine High – during the Focus Period.

C. Moreover, the downward changes in expectations about Alpine High were driven by deteriorating commodity prices

107. During the Focus Period, contrary to Plaintiffs' claims, downward changes in expectations of Alpine High, including decisions to reduce production and drilling, were due to changes in commodity prices during the Focus Period and were not in relation to any new understanding of the reserves or reserve mix at Alpine High.

108. During the Focus Period, analysts repeatedly explained that Apache's decisions to defer and/or reduce production and drilling at Alpine High were responses to generally weakening commodity prices, particularly the weakening Waha Hub natural gas prices and NGL prices.

109. The Complaint outlines three announcements of reduced or deferred Alpine High activity during the Focus Period: April 23, 2019, October 31, 2019, and February 26, 2020.[119] However, after *all* of these announcements, neither the Company nor any analyst associated the Company's decision to reduce Alpine High activity with the alleged lack of oil and wet gas reserves or the mix of oil and wet gas vs. dry gas. Instead, both the Company and analysts attributed the reduced or deferred Alpine High activity announced on those dates to the deterioration in commodity prices, and, throughout the Focus Period, analysts consistently considered Alpine High to be rich in natural gas and NGL.[120]

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[118] From 2018 to 2020, approximately 80% of Apache's total production revenue was made up of oil production. Apache FY20 Form 10-K, filed February 26, 2021, p. 36.

[119] Complaint, ¶¶104, 106, 310-311.

[120] See, Section VIII.A.

110. As discussed in detail in Section VII.B.1. above, after the April 23, 2019 announcement of a deferral of Alpine High activity, both the Company and analysts attributed the deferred activity to "extremely low" regional gas prices. In fact, analysts noted that the market expected the announcement given the "extremely low" prices.

111. On October 31, 2019, in its 3Q19 conference call, Apache announced that it had reduced drilling activity at Alpine High, as a result of continued weakness in gas and NGL pricing.[121] However, this was not a surprise to the market as analysts indicated that the reduction in activity was expected given the weak gas prices and some analysts had even suggested in the weeks before October 31, 2019 that Apache reduce activity in Alpine High given the weak commodity price outlook.

112. For example, more than one week before October 31, 2019, analysts at Barclays indicated that commodity prices were making Alpine High "uneconomic" and suggested that Alpine High activity should be reduced if NGL prices could not recover.

> Based on current commodity prices, we estimate that APA's cryogenic processing units in the Alpine High are uneconomic. […] Our analysis suggests that absent a recovery in NGL prices, Alpine High activity needs to be cut in half in 2020, resulting in a YoY production decline. Alpine High activity needs to drop to 2.5 rigs to break even on the cryo processing plants. [Barclays, 10/21/19]

113. After Apache's announcement of reduced Alpine High activity on October 31, 2019, many analysts stated that the news was expected due to prolonged weakness in gas and NGL prices. For example:

> **As we had anticipated, current commodity pricing dictates an Alpine High slowdown into 2020.** APA has reduced Alpine High drilling activity to 2 rigs (from an average of 5 rigs in 3Q) and is deferring some 4Q completions into 2020. [Cowen, 10/30/2019, emphasis added]

> **As previously signaled by the company**, APA has moderated activity at Alpine High to 2 rigs vs. 5 rigs in 3Q19 and has decided to defer completions into 2020, which will negatively impact the 4Q19 Alpine High guide by 5%. [JP Morgan, 10/31/2019, emphasis added]

> **In light of prolonged weakness in gas and NGL pricing of late**, APA reduced drilling activity in the Alpine High to 2 rigs (vs. a 3Q average of 5) and plans to defer some completions into FY20. [Piper, 10/30/19, emphasis added]

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[121] Complaint, ¶104. See also, Apache 3Q19 earnings conference call, October 31, 2019 and "Apache Corporation Announces Third-Quarter 2019 Financial and Operational Results," *Apache Press Release*, October 30, 2019.

114. On February 26, 2020, in its 4Q19 earnings press release, Apache announced that as of the end of 2019, "there were no rigs drilling at Alpine High."[122] In the same press release, Apache indicated that it was moving away from Alpine High due to the "deteriorating natural gas and NGL prices."[123] In its earnings call on February 27, the Company further discussed the impact that the "natural gas and NGL collapse" had on the "economic competitiveness" of Alpine High and that "gas NGL prices fell to less than half of the prices" that the Company had anticipated.[124]

115. Moreover, analysts indicated that Apache's pivot away from Alpine High was expected given the low gas prices.[125] For example:

> **As anticipated**, APA is **completing its pivot away from Alpine High (zero rigs in 2020** and potential volume curtailment depending on Waha prices) as the company prepares for increased activity in Suriname. [Barclays, 2/26/20, emphasis added]
>
> APA noted it is lowering spend in Alpine High given challenging NG and NGL pricing (**had to be expected**) and we note if Waha stays weak production could be curtailed. [UBS, 2/26/20, emphasis added]
>
> Apache shares have bucked the market disaster trend this week given investors' conventional production growth preference along with steady US baseline business. **The company has smartly moved on from Alpine High** with renewed focus in Suriname, Egypt, North Sea and the Permian along with potential exploration projects. [...] **While Alpine High demonstrated negative results for Apache due to low natural gas/NGL prices** and underperformance from density tests, we believe the company's decision to drop to no activity in the play is the right one to make in order to better focus on the opportunities at hand. [Truist Securities, 2/27/20, emphasis added]

116. In sum, after all three announcements, neither the Company nor any analyst associated the Company's decision to reduce Alpine High activity with the alleged lack of oil and wet gas reserves or the mix of oil and wet gas vs. dry gas. Instead, both the Company and

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[122] Complaint, ¶106. See also, "Apache Corporation Announces Fourth-Quarter and Full-Year 2019 Financial and Operational Results," *Apache Press Release*, February 26, 2020.

[123] "Apache Corporation Announces Fourth-Quarter and Full-Year 2019 Financial and Operational Results," *Apache Press Release*, February 26, 2020.

[124] Apache 4Q19 and FY19 earnings conference call, February 27, 2020.

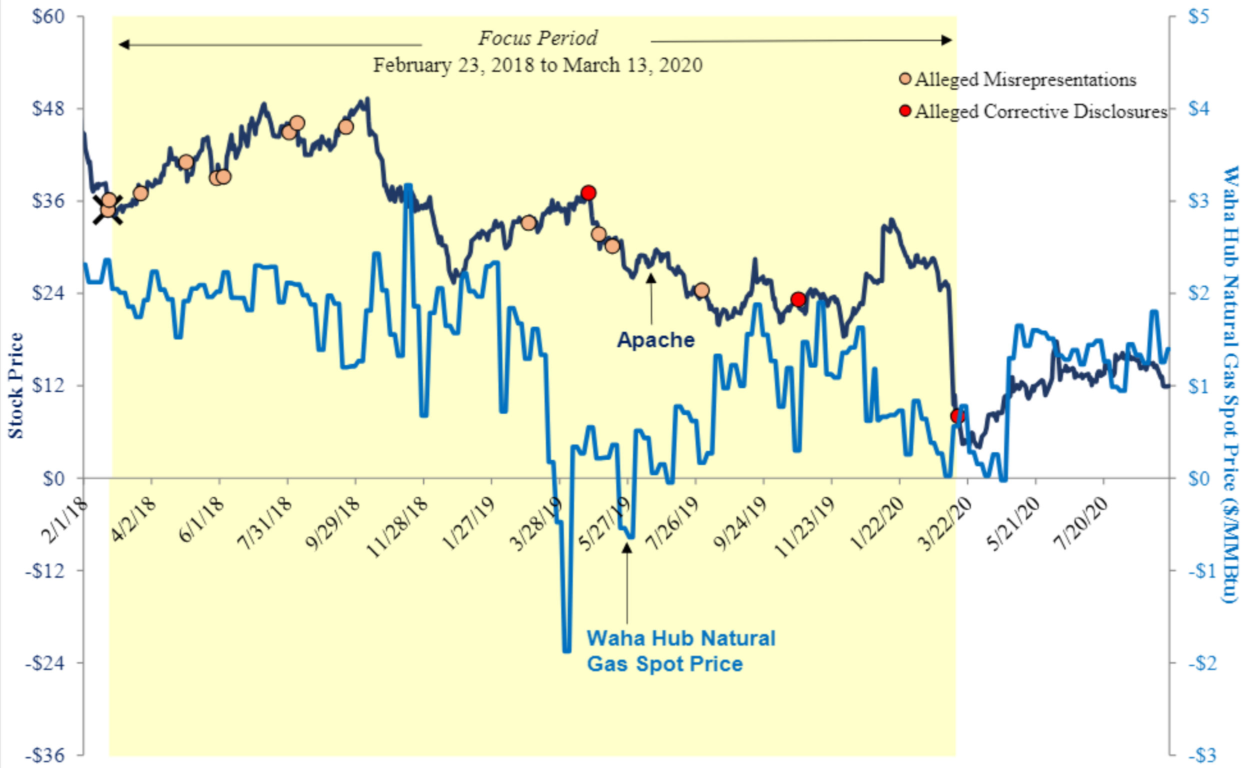
[125] By January 2020, the market was already aware that there were no rigs drilling at Alpine High. See, for example, JP Morgan analyst report, dated January 22, 2020 ("Alpine High: In 4Q19, we expect APA to bring online 27 TILs and average 2 drilling rigs. We are modeling 2 rigs in 2020 to support 40 TILs next year, although we note that the company's rigcount has recently gone to zero.").

analysts attributed the reduced or deferred Alpine High activity announced on those dates to the deterioration in commodity prices.

117. As discussed in Section VIII.B, Apache's stock moved in-line with the E&P industry and oil prices during the Focus Period. Apache's stock price also moved in-line with regional natural gas and NGL prices during this period. In particular, the chart below shows the movements of Apache's stock price and the Waha Hub natural gas spot price, the pricing benchmark for natural gas produced in the Permian region, including Alpine High.[126] As shown in the chart, Apache's stock price and the Waha Hub natural gas spot price both generally declined during the Focus Period. In particular, as discussed in Section VII.B.1, the Waha Hub natural gas spot price became negative in March 2019 after unplanned pipeline failures. In the following four months, the Waha Hub natural gas spot price stayed around zero dollars, while Apache's stock continued to decline. Similarly, around the end of the Focus Period, the Waha Hub natural gas spot price was again close to zero dollars and Apache's stock also plummeted, amid heightened market volatility due to the Covid pandemic.

[126] See, for example, "Waha Hub spot gas' basis spread blows out on PHP maintenance," *S&P Global Commodity Insights*, May 2, 2022.

Weekly Waha Hub Natural Gas Spot Price and Apache Stock Price

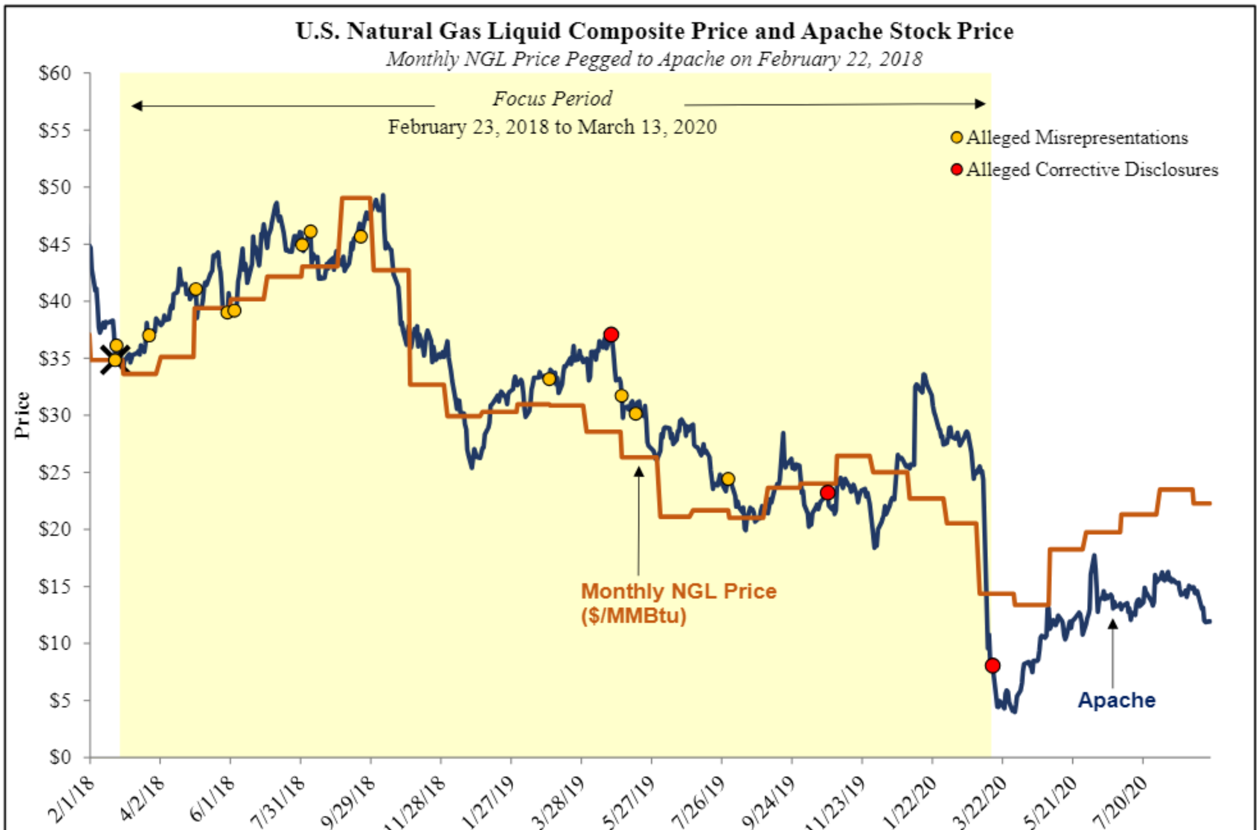


Notes and Sources:
Data from Bloomberg L.P. Events from the Complaint. Weekly average Waha Hub spot price is plotted.

118. Consistent with the discussion of analyst commentary in Section VII.B., prices of NGL, another important product for Alpine High, generally declined during the Focus Period. In particular, the chart below shows the movements of Apache's stock price and the monthly U.S. natural gas liquid composite price (the "NGL composite price") from the Federal Reserve Bank of St. Louis. NGLs refer to a category of hydrocarbons that have similar chemical composition, including ethane, propane, and butane.[127] Hydrocarbon products in the NGL category are traded individually and thus have their own price. The NGL composite price is a monthly updated pricing proxy that reflects the spot prices and production volumes of all NGL products.[128] As shown in the chart, Apache's stock price moved in-line with the NGL composite price during the Focus Period, increasing during 2Q18 and 3Q18, decreasing between 4Q18 and 2Q19, and decreasing in March 2020 with the start of the Covid pandemic.

[127] "What are natural gas liquids and how are they used?" *U.S. Energy Information Administration*, April 20, 2012.

[128] "Definitions, Sources and Explanatory Notes," *U.S. Energy Information Administration.*



Notes and Sources:
Data from Bloomberg, L.P and FRED. The U.S. Natural Gas Liquids Composite price is updated monthly by the U.S. Energy Information Administration. Events from the Complaint.

119. Further, Apache's stock price moved in-line with Cimarex Energy Co. ("Cimarex"), another E&P company that was heavily exposed to Waha Hub natural gas prices and NGL prices.[129] For example, according to a Piper Sandler E&P industry report, Cimarex's stock was a "solid proxy for investor sentiment/concern on Waha pricing."[130] As another example, a Barclays E&P industry report stated that Apache and Cimarex "ha[d] the highest exposure to NGLs among large caps."[131] During the Focus Period, Cimarex was a member of a "designated Peer Group" that Apache used to measure total shareholder returns to determine employee stock awards.[132] Cimarex was also a member of Dr. Nye's industry index for the

[129] Cimarex Energy merged with Cabot Oil & Gas Corporation in October 2021 to form Coterra Energy Inc. See, Cimarex Form 8-K, filed October 1, 2021.

[130] Piper Sandler analyst report, dated June 27, 2019. See also, Evercore analyst report, dated August 19, 2018 ("[T]he stock has become the epicenter of fears surrounding [natural gas] bottlenecks in the Delaware basin despite efforts to secure firm sales agreements and hedge local basis.")

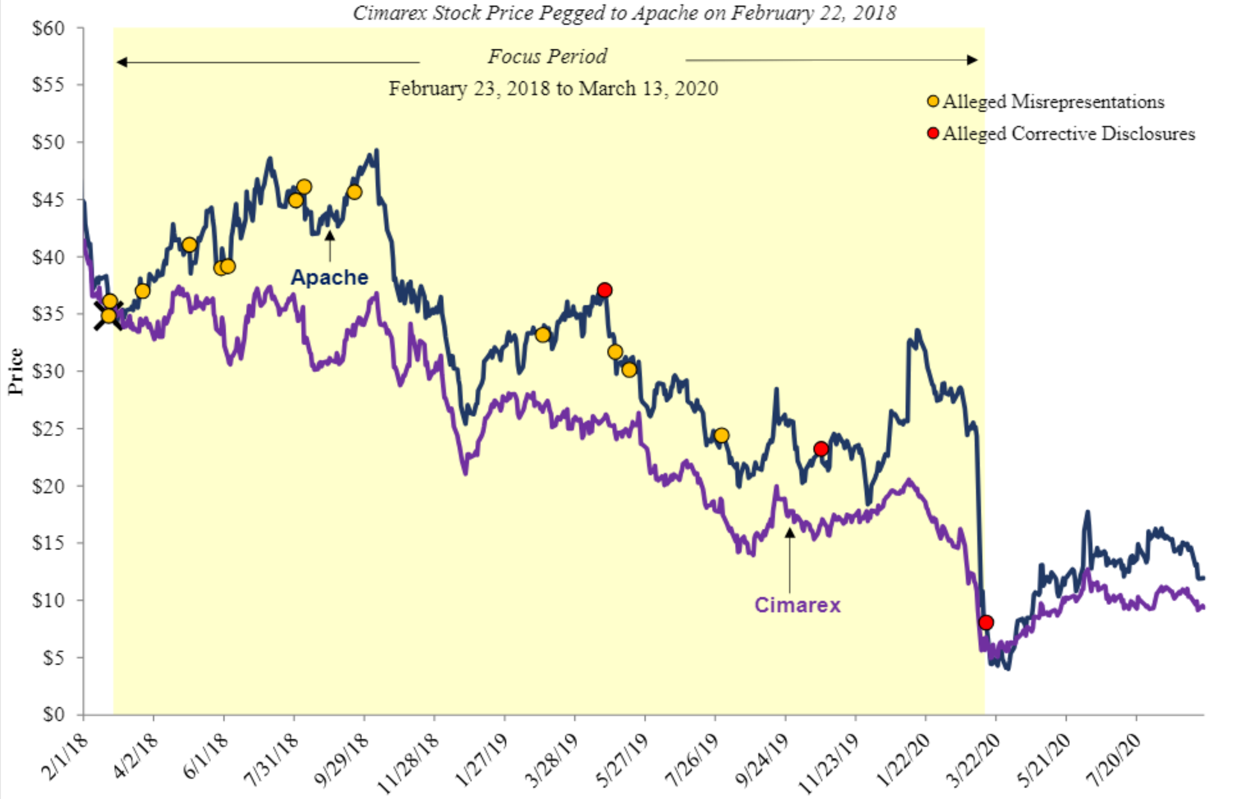
[131] Barclays analyst report, dated July 9, 2019.

[132] See, for example, Apache FY20 Form 10-K, filed February 26, 2021, Schedule B and Apache FY19 Form 10-K, filed February 28, 2020, Schedule B.

majority of the Focus Period. The chart below shows the movements of Apache's stock and Cimarex's stock during the Focus Period. Both Apache's stock and Cimarex's stock generally declined during the Focus Period, with Cimarex's stock trading below Apache's stock for the majority of the period.[133] Both stocks showed a similar rate of decline in 2Q and 3Q19, following the "collapse" of Waha Hub natural gas prices and NGL prices discussed in Section VII.B.1.

Cimarex and Apache Stock Price

Cimarex Stock Price Pegged to Apache on February 22, 2018



Notes and Sources:
Data from Bloomberg, L.P. and "NYE_00000001.xlsx." Events from the Complaint.

120. As detailed below, strong evidence that there is no price impact and no link between the alleged misrepresentations and Apache's stock price during the Focus Period is the fact that when commodity prices recovered *after* the Focus Period ended, Apache resumed its previously curtailed production and drilling at Alpine High.

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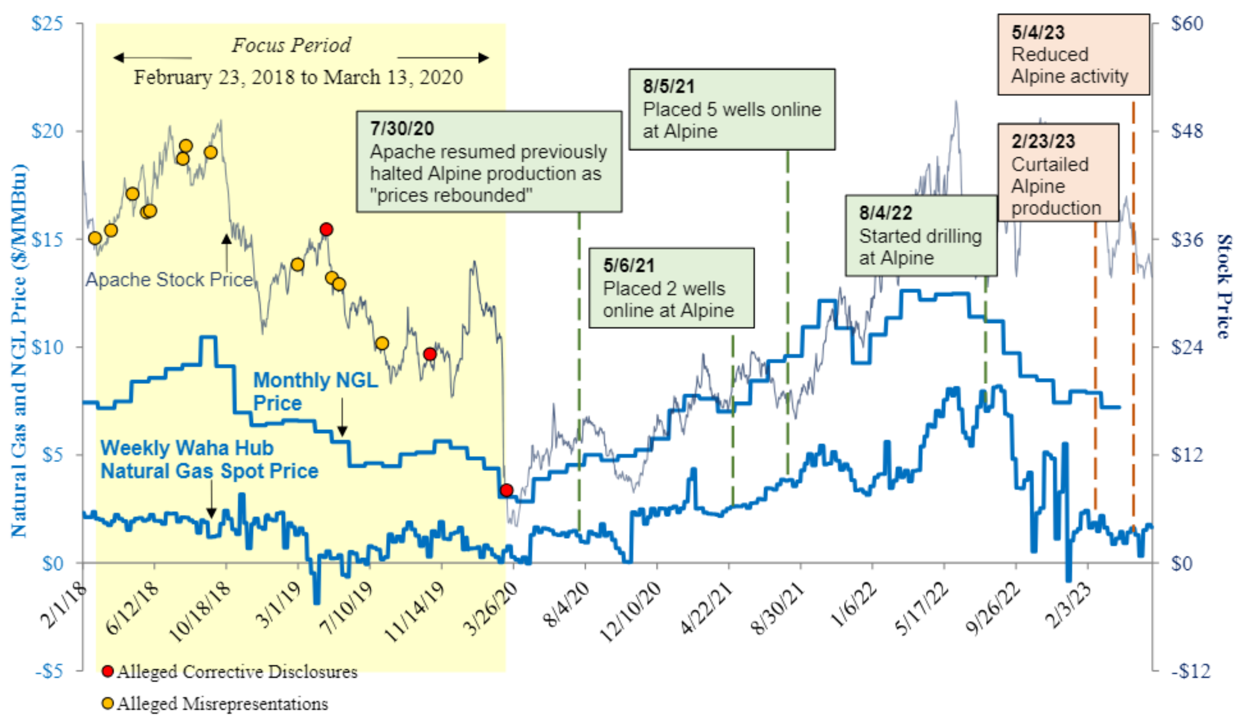
133 During the Focus Period, Cimarex had a similar share of production revenue from natural gas and an almost doubled share from NGL compared to Apache. See, for example, Cimarex FY20 Form 10-K, filed February 23, 2021, p. 43.

121. The chart below outlines Company commentary regarding the resumption of activity at Alpine High, along with the Waha Hub Natural Gas Spot Price and the NGL Composite Price.

Select Company Commentary on Alpine High Activity Resumption
Waha Hub Natural Gas Spot Price, NGL Price, and Apache Stock Price



Notes and Sources:
Data from Bloomberg, L.P., and FRED. Weekly average Waha Hub Natural Gas Spot Price is plotted. Waha prices from February 11-18, 2021 (reached record highs during a winter storm) are assumed to be equal to the Waha price on February 10, 2021. NGL price is updated monthly and only available as of March, 2023. Events from the Complaint and Apache conference calls and press releases.

122. Specifically, as shown above, in July 2020, after the end of the Focus Period, the Company announced that it had returned previously curtailed volumes at Alpine High to production "as prices rebounded."[134] As the trends of NGL and natural gas price recoveries continued in May 2021, Apache announced that it had placed 2 wells online at Alpine High.[135] In the fall of 2021, Apache indicated that it would "evaluate" restarting drilling at Alpine High

[134] Apache 2Q20 earnings conference call, July 30, 2020 and "Apache Corporation Announces Second-Quarter 2020 Financial and Operational Results," *Apache Press Release*, July 29, 2020.

[135] Apache 1Q21 earnings conference call, May 6, 2021.

given the improvement in gas and NGL prices.[136] Analysts also linked the restart of drilling at Alpine High to gas and NGL prices. For example, Bank of America stated:

> Frankly, we do not see that [Alpine High spending] as that much of a hurdle given current NGL & gas prices and would increase utilization on the existing Alpine High facilities. [Bank of America, 10/21/21]

123. In March 2022, Apache announced that drilling would resume at Alpine High later in the year.[137] In August 2022, Apache resumed drilling at Alpine High.[138] Analysts commented on Apache's drilling resumption at Alpine High, noting the improved gas and NGL prices. For example, Evercore noted:

> APA will head back to Alpine High in the 2H to drill a pad which at these natural gas and NGL prices we have to believe far exceed the return aspirations the first time around. [Evercore, 8/3/22]

124. Similarly, a news article commented that Apache was "back to work" on "strong natural gas pricing and demand":

> On strong natural gas pricing and demand, APA Corp. is back to work drilling its first pad since 2019 in the Alpine High in the Permian Basin of West Texas. ["APA Drilling First Pad Since 2019 in Permian's Natural Gas-Rich Alpine High as Prices, Demand Soar," *NGI's All News Access*, 11/8/22]

125. In February 2023, as gas prices declined, Apache announced that it had curtailed Alpine High production as a result of Waha price volatility.[139] In May 2023, 10 months after Apache resumed drilling at Alpine High, the Company announced that it would reduce drilling

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[136] Apache 2Q21 earnings conference call, August 5, 2021 ("But we look at that all of the time, certainly with gas and NGL prices improving in the recent months and could continue to improve. That will be something that we will evaluate. And as we finish up this year and roll into next year, we'll get into the actual capital program for 2022, which very well could include some capital for Alpine High.").

[137] "APA Corporation Closes Two Transactions; Receives $1 Billion of Proceeds," *GlobeNewswire*, March 14, 2022 ("The transaction follows the combination of Altus Midstream and BCP Raptor Holdco LP that formed Kinetik and was completed in late February. Within the next 24 months, Apache will invest a minimum of $100 million for new well drilling and completion activity at the Alpine High play in the Delaware Basin, where Kinetik has exclusive gas and NGL gathering and processing rights."). See also, Apache 1Q22 earnings conference call, May 5, 2022 ("Following this, the rig will mobilize to Alpine High to resume gas and NGL development drilling in the summer.").

[138] Apache 2Q22 earnings conference call, August 4, 2022 ("In the U.S., we continue to run a steady 2-rig program in the Southern Midland Basin and recently initiated drilling at Alpine High with a third rig.").

[139] Apache 4Q22 earnings conference call, February 23, 2023 ("Our curtailments [at Alpine High] earlier in the year were relatively small. But when Waha -- Waha has had a lot of volatility. So, as we get down to the low Waha basis and sometimes it's going negative. So, we're making those decisions daily and weekly.").

activity due to "the prevailing weakness in Waha natural gas prices."[140] A *Bloomberg* article noted that, once again, reducing drilling activity at Alpine High was "prudent" given weak Waha Hub natural gas prices:

> Post-1Q Earnings Outlook: Lowering its upstream capital budget this year -- as it reduces its dry natural gas drilling activity at Alpine High -- is prudent for APA with weakness in its key Waha hub price. ["Waha Price to Hurt APA Permian Gas Activity: Earnings Outlook," *Bloomberg*, 5/5/23]

126. Thus, the downward changes in expectations about Alpine High, including production and drilling decisions, were driven by changes in commodity prices and not in relation to any new understanding of the reserves or reserve mix at Alpine High, both during and after the Focus Period.

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Lucy P. Allen

[140] Apache 1Q23 earnings conference call, May 4, 2023.

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Appendix A

LUCY P. ALLEN
SENIOR MANAGING DIRECTOR

Education

YALE UNIVERSITY
M.Phil., Economics, 1990
M.A., Economics, 1989
M.B.A., 1986

STANFORD UNIVERSITY
A.B., Human Biology, 1981

Professional Experience

1994-Present	**National Economic Research Associates, Inc.** Senior Managing Director. Responsible for economic analysis in the areas of securities, finance and environmental and tort economics. Managing Director (2016-2023). Senior Vice President (2003-2016). Vice President (1999-2003). Senior Consultant (1994-1999).
1992-1993	**Council of Economic Advisers, Executive Office of the President** Staff Economist. Provided economic analysis on regulatory and health care issues to Council Members and interagency groups. Shared responsibility for regulation and health care chapters of the *Economic Report of the President, 1993*. Working Group member of the President's National Health Care Reform Task Force.
1986-1988 1983-1984	**Ayers, Whitmore & Company (General Management Consultants)** Senior Associate. Formulated marketing, organization, and overall business strategies including: Plan to improve profitability of chemical process equipment manufacturer. Merger analysis and integration plan of two equipment manufacturers. Evaluation of Korean competition to a U.S. manufacturer.

Diagnostic survey for auto parts manufacturer on growth obstacles.
Marketing plan to increase international market share for major accounting firm.

Summer 1985 **WNET/Channel Thirteen, Strategic Planning Department**
Associate. Assisted in development of company's first long-term strategic plan. Analyzed relationship between programming and viewer support.

1981-1983 **Arthur Andersen & Company**
Consultant. Designed, programmed and installed management information systems. Participated in redesign/conversion of New York State's accounting system. Developed municipal bond fund management system, successfully marketed to brokers. Participated in President's Private Sector Survey on Cost Control (Grace Commission). Designed customized tracking and accounting system for shipping company.

Teaching

1989- 1992 **Teaching Fellow, Yale University**
Honors Econometrics
Intermediate Microeconomics
Competitive Strategies
Probability and Game Theory
Marketing Strategy
Economic Analysis

Publications

"Snapshot of Recent Trends in Asbestos Litigation: 2022 Update," (co-author), NERA Report, 2022.

"Snapshot of Recent Trends in Asbestos Litigation: 2021 Update," (co-author), NERA Report, 2021.

"The Short-Term Effect of Goodwill Impairment Announcements on Companies' Stock Prices" (co-author), *International Journal of Business, Accounting and Finance,* Volume 14, Number 2, Fall 2020.

"Snapshot of Recent Trends in Asbestos Litigation: 2020 Update," (co-author), NERA Report, 2020.

"Snapshot of Recent Trends in Asbestos Litigation: 2019 Update," (co-author), NERA Report, 2019.

"Snapshot of Recent Trends in Asbestos Litigation: 2018 Update," (co-author), NERA Report, 2018.

"Trends and the Economic Effect of Asbestos Bans and Decline in Asbestos Consumption and Production Worldwide," (co-author), *International Journal of Environmental Research and Public Health*, 15(3), 531, 2018.

"Snapshot of Recent Trends in Asbestos Litigation: 2017 Update," (co-author), NERA Report, 2017.

"Asbestos: Economic Assessment of Bans and Declining Production and Consumption," World Health Organization, 2017.

"Snapshot of Recent Trends in Asbestos Litigation: 2016 Update," (co-author), NERA Report, 2016.

"Snapshot of Recent Trends in Asbestos Litigation: 2015 Update," (co-author), NERA Report, 2015.

"Snapshot of Recent Trends in Asbestos Litigation: 2014 Update," (co-author), NERA Report, 2014.

"Snapshot of Recent Trends in Asbestos Litigation: 2013 Update," (co-author), NERA Report, 2013.

"Asbestos Payments per Resolved Claim Increased 75% in the Past Year – Is This Increase as Dramatic as it Sounds? Snapshot of Recent Trends in Asbestos Litigation: 2012 Update," (co-author), NERA Report, 2012.

"Snapshot of Recent Trends in Asbestos Litigation: 2011 Update," (co-author), NERA White Paper, 2011.

"Snapshot of Recent Trends in Asbestos Litigation: 2010 Update," (co-author), NERA White Paper, 2010.

"Settlement Trends and Tactics" presented at Securities Litigation During the Financial Crisis: Current Development & Strategies, hosted by the New York City Bar, New York, New York, 2009.

"Snapshot of Recent Trends in Asbestos Litigation," (co-author), NERA White Paper, 2009.

"China Product Recalls: What's at Stake and What's Next," (co-author), NERA Working Paper, 2008.

"Forecasting Product Liability by Understanding the Driving Forces," (co-author), The International Comparative Legal Guide to Product Liability, 2006.

"Securities Litigation Reform: Problems and Progress," Viewpoint, November 1999, Issue No. 2 (co-authored).

"Trends in Securities Litigation and the Impact of the PSLRA," Class Actions & Derivative Suits, American Bar Association Litigation Section, Vol. 9, No. 3, Summer 1999 (co-authored).

"Random Taxes, Random Claims," Regulation, Winter 1997, pp. 6-7 (co-authored).

Depositions & Testimony (4 years)

Deposition Testimony before the United States District Court for the Central District of California in *In re Prime Healthcare ERISA Litigation,* 2023.

Deposition Testimony before the United States District Court for the Southern District of Texas in *Delaware County Employees Retirement System v. Cabot Oil & Gas Corporation, et al.,* 2023.

Testimony and Deposition before the United States District Court for the District of Oregon in *Oregon Firearms Federation, Inc. et al. v. Tina Kotek et al.*, 2023.

Testimony and Depositions before the United States District Court for the Southern District of Texas, Houston Division in *Miriam Edwards, et al. v. McDermott International, Inc., et al.,* 2023.

Deposition Testimony before the United States District Court for the District of Harris County, Texas in *Boxer Property Management Corp. et al. v. Illinois Union Ins. Co. et al.*, 2022.

Testimony before the Supreme Court of the State of New York, County of New York, in *MUFG Union Bank, N.A. (f/k/a Union Bank, N.A.) v. Axos Bank (f/k/a Bank of Internet USA), et al.*, 2022.

Deposition Testimony before the United States District Court for the Eastern District of Virginia, in *Plymouth County Retirement System, et al. v. Evolent Health, Inc., et al.,* 2022.

Deposition Testimony before the United States District Court for the Northern District of Georgia, in *Public Employees' Retirement System of Mississippi v. Mohawk Industries, Inc., et al.,* 2022.

Deposition Testimony before the United States District Court for the Southern District of New York, in *SEC v. AT&T, Inc. et al.*, 2022.

Deposition Testimony before the Superior Court of New Jersey, Hudson County, in *Oklahoma Firefighters Pension and Retirement System vs. Newell Brands Inc., et al.,* 2022.

Deposition Testimony before the United States District Court for the District of Pennsylvania, in *Allegheny County Employees, et al. v. Energy Transfer LP., et al.*, 2022.

Deposition Testimony before the United States District Court, District of Tennessee, in *St. Clair County Employees' Retirement System v. Smith & Acadia Healthcare Company, Inc., et al.*, 2022.

Deposition Testimony before the United States District Court, District of Colorado, in *Cipriano Correa, et al. v. Liberty Oilfield Services Inc., et al.*, 2022.

Deposition Testimony before the Superior Court of New Jersey, Hudson County, in *Oklahoma Firefighters Pension and Retirement System vs. Newell Brands Inc., et al.*, 2021.

Deposition Testimony before the Superior Court of New Jersey, Middlesex County, in *Dana Transport, Inc. et al., vs. PNC Bank et al.*, 2021.

Deposition Testimony before the United States District Court, Western District of North Carolina, in *Cheyenne Jones and Sara J. Gast v. Coca-Cola Consolidated Inc., et al.*, 2021.

Testimony and Deposition Testimony before the Court of Chancery of the State of Delaware in *Bardy Diagnostics Inc. v. Hill-Rom, Inc. et al.*, 2021.

Deposition Testimony before the United States Bankruptcy Court, Southern District of Texas, Houston Division, in *Natixis Funding Corporation v. Genon Mid-Atlantic, LLC*, 2021.

Testimony and Deposition Testimony before the United States District Court, Southern District of California, in *Miller et al. v. Becerra et al.*, 2021.

Deposition Testimony before the Court of Chancery of the State of Delaware in *Arkansas Teacher Retirement System v. Alon USA Energy, Inc., et al.*, 2021.

Deposition Testimony before the United States District Court, Western District of Oklahoma, in *Kathleen J. Myers v. Administrative Committee, Seventy Seven Energy, Inc. Retirement & Savings Plan, et al.*, 2020.

Deposition Testimony before the United States District Court, Middle District of Tennessee, in *Nikki Bollinger Grae v. Corrections Corporation of America, et al.*, 2020.

Deposition Testimony before the Supreme Court of the State of New York, County of New York, in *MUFG Union Bank, N.A. (f/k/a Union Bank, N.A.) v. Axos Bank (f/k/a Bank of Internet USA), et al.*, 2020.

Deposition Testimony before the United States District Court, Western District of Washington at Seattle, in *In re Zillow Group, Inc. Securities Litigation*, 2020.

Deposition Testimony before the United States District Court, Middle District of Tennessee, in *Zwick Partners LP and Aparna Rao v. Quorum Health Corporation,* 2019.

Testimony and Declaration before the United States District Court, Southern District of Iowa, in *Mahaska Bottling Company, Inc., et al. v. PepsiCo, Inc. and Bottling Group, LLC*, 2019.

Testimony before the United States District Court, Southern District of New York, in *Chicago Bridge & Iron Company N.V. Securities Litigation*, 2019.

Deposition Testimony before the United States District Court, Middle District of Florida, in *Jacob J. Beckel v. Fagron Holdings USA, LLC et al.*, 2019.

Appendix B – Materials Considered

<u>Case documents and filings in this matter</u>

1. Consolidated Class Action Complaint, filed December 17, 2021 ("Complaint")

2. Memorandum and Recommendation on Motion to Dismiss, filed September 15, 2022

3. Order Adopting Magistrate Judge's Memorandum and Recommendation, filed November 29, 2022

4. Lead Plaintiffs' Motion for Class Certification and Appointment of Class Representatives and Class Counsel and Supporting Memorandum of Law, filed April 7, 2023 ("Plaintiffs' Motion for Class Certification")

5. Expert Report of Zachary Nye, Ph.D., dated April 7, 2023, including exhibits, appendices, and materials considered and turned over ("Nye Report")

6. Deposition of David Sullivan (former Executive Director at Co-Lead Plaintiff Plymouth County Retirement System), dated May 25, 2023 ("Sullivan Deposition")

7. Deposition of Jay Smith (Fund Administrator at Co-Lead Plaintiff Trustees of the Teamsters Union No. 142 Pension Fund), dated June 6, 2023

<u>Apache's filings with the Securities and Exchange Commission ("SEC") between 2016 and 2023, including</u>

1. 1Q16 10-Q, filed May 6, 2016

2. 2Q16 10-Q, filed August 4, 2016

3. 3Q16 10-Q, filed November 4, 2016

4. FY16 Form 10-K, filed February 24, 2017

5. 1Q17 10-Q, filed May 5, 2017

6. 2Q17 10-Q, filed August 4, 2017

7. 3Q17 10-Q, filed November 3, 2017

8. FY17 Form 10-K, filed February 23, 2018

9. 1Q18 10-Q, filed May 3, 2018

10. 2Q18 10-Q, filed August 2, 2018

11. 3Q18 10-Q, filed November 1, 2018

12. FY18 Form 10-K, filed March 1, 2019

13. 1Q19 10-Q, filed May 3, 2019

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14. 2Q19 10-Q, filed August 1, 2019
15. 3Q19 10-Q, filed October 31, 2019
16. FY19 Form 10-K, filed February 28, 2020
17. 1Q20 10-Q, filed May 7, 2020
18. 2Q20 10-Q, filed July 30, 2020
19. 3Q20 10-Q, filed November 5, 2020
20. FY20 Form 10-K, filed February 26, 2021
21. 1Q21 10-Q, filed May 7, 2021
22. 2Q21 10-Q, filed August 5, 2021
23. 3Q21 10-Q, filed November 5, 2021
24. FY21 Form 10-K, filed February 22, 2022
25. 1Q22 10-Q, filed May 5, 2022
26. 2Q22 10-Q, filed August 4, 2022
27. 3Q22 10-Q, filed November 3, 2022
28. FY22 Form 10-K, filed February 23, 2023
29. 1Q23 10-Q, filed May 4, 2023

Apache's press releases, presentations, and conference call transcripts from 2016 to 2023, from Factiva and FactSet Research Systems, Inc.

Analyst reports on Apache

1. 2016.09.07 - Bank of America
2. 2016.09.07 - Cowen
3. 2016.09.07 - Credit Suisse
4. 2016.09.07 - Piper Sandler
5. 2016.09.07 - UBS
6. 2016.09.08 - BMO
7. 2016.09.08 - Credit Suisse
8. 2016.09.08 - Societe

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9. 2016.09.12 - Jefferies
10. 2016.09.14 - KLR Group
11. 2016.09.16 - Piper Sandler
12. 2016.09.26 - MUFG
13. 2016.09.26 - UBS
14. 2016.10.05 - Societe
15. 2016.10.26 - Credit Suisse
16. 2016.11.03 - Barclays
17. 2016.11.03 - BMO
18. 2016.11.03 - Bank of America (1)
19. 2016.11.03 - Bank of America (2)
20. 2016.11.03 - Cowen
21. 2016.11.03 - Piper Sandler
22. 2016.11.03 - Societe
23. 2016.11.03 - UBS (1)
24. 2016.11.03 - UBS (2)
25. 2016.11.04 - Credit Suisse
26. 2016.11.07 - MUFG
27. 2016.11.11 - BMO
28. 2016.11.11 - KLR Group
29. 2016.11.15 - Credit Suisse (1)
30. 2016.11.15 - Credit Suisse (2)
31. 2016.11.15 - Societe
32. 2016.11.21 - Piper Sandler
33. 2017.01.06 - Piper Sandler
34. 2017.01.11 - Societe
35. 2017.01.17 - Jefferies

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36. 2017.01.26 - Barclays
37. 2017.02.13 - Piper Sandler
38. 2017.02.14 - BMO
39. 2017.02.14 - Credit Suisse
40. 2017.02.14 - Societe
41. 2017.02.14 - UBS
42. 2017.02.21 - Credit Suisse
43. 2017.02.23 - Barclays
44. 2017.02.23 - BMO
45. 2017.02.23 - Bank of America
46. 2017.02.23 - Cowen
47. 2017.02.23 - Deutsche Bank
48. 2017.02.23 - Evercore
49. 2017.02.23 - JP Morgan
50. 2017.02.23 - Morgan Stanley
51. 2017.02.23 - Piper Sandler (1)
52. 2017.02.23 - Piper Sandler (2)
53. 2017.02.23 - RBC (1)
54. 2017.02.23 - RBC (2)
55. 2017.02.23 - Societe
56. 2017.02.23 - UBS
57. 2017.02.23 - Wells Fargo
58. 2017.02.24 - Bank of America
59. 2017.02.24 - Seaport
60. 2017.02.24 - UBS
61. 2017.02.27 - Credit Suisse
62. 2017.02.27 - Wells Fargo

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63. 2017.02.28 - MUFG
64. 2017.03.02 - Barclays
65. 2017.03.10 - Scotiabank (1)
66. 2017.03.10 - Scotiabank (2)
67. 2017.03.14 - Piper Sandler
68. 2017.03.17 - Jefferies
69. 2017.03.20 - KLR Group
70. 2017.03.27 - Scotiabank
71. 2017.04.03 - Scotiabank
72. 2017.04.18 - Jefferies
73. 2017.04.20 - Barclays
74. 2017.04.24 - Scotiabank
75. 2017.05.04 - Barclays
76. 2017.05.04 - BMO
77. 2017.05.04 - Cowen
78. 2017.05.04 - Scotiabank
79. 2017.05.04 - UBS (1)
80. 2017.05.04 - UBS (2)
81. 2017.05.05 - Credit Suisse
82. 2017.05.05 - Societe
83. 2017.05.08 - Barclays
84. 2017.05.15 - Societe
85. 2017.05.16 - KLR Group
86. 2017.05.18 - Societe
87. 2017.05.23 - UBS
88. 2017.06.07 - UBS
89. 2017.06.13 - Cowen

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90. 2017.06.20 - Barclays
91. 2017.06.29 - Scotiabank
92. 2017.07.06 - Barclays
93. 2017.07.06 - UBS
94. 2017.07.07 - Barclays
95. 2017.07.07 - Scotiabank
96. 2017.07.10 - Societe
97. 2017.07.18 - Scotiabank
98. 2017.07.21 - Scotiabank
99. 2017.08.03 - Barclays
100. 2017.08.03 - BMO
101. 2017.08.03 - Bank of America
102. 2017.08.03 - Cowen
103. 2017.08.03 - Deutsche Bank
104. 2017.08.03 - Evercore
105. 2017.08.03 - JP Morgan
106. 2017.08.03 - Morgan Stanley
107. 2017.08.03 - RBC
108. 2017.08.03 - Scotiabank
109. 2017.08.03 - Societe
110. 2017.08.04 - Scotiabank
111. 2017.08.07 - Barclays
112. 2017.08.07 - Evercore
113. 2017.08.08 - BMO
114. 2017.08.08 - KLR Group
115. 2017.08.08 - Wells Fargo
116. 2017.08.11 - Scotiabank

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Appendix B – Materials Considered

117. 2017.08.18 - Cowen
118. 2017.08.21 - Scotiabank
119. 2017.08.29 - Jefferies
120. 2017.09.07 - MUFG
121. 2017.09.28 - Scotiabank
122. 2017.10.10 - Barclays
123. 2017.10.10 - Bank of America
124. 2017.10.10 - Deutsche Bank
125. 2017.10.10 - Evercore
126. 2017.10.10 - Jefferies
127. 2017.10.10 - JP Morgan
128. 2017.10.10 - Morgan Stanley
129. 2017.10.10 - RBC
130. 2017.10.10 - Scotiabank (1)
131. 2017.10.10 - Scotiabank (2)
132. 2017.10.10 - Seaport (1)
133. 2017.10.10 - Seaport (2)
134. 2017.10.11 - Barclays
135. 2017.10.16 - BMO
136. 2017.10.17 - BMO
137. 2017.10.18 - Societe
138. 2017.10.24 - Scotiabank
139. 2017.10.27 - Cowen
140. 2017.11.02 - Jefferies
141. 2017.11.02 - Societe
142. 2017.11.03 - Jefferies
143. 2017.11.13 - Scotiabank

Appendix B – Materials Considered

144. 2017.11.20 - Barclays
145. 2017.11.21 - Scotiabank
146. 2017.12.14 - Scotiabank
147. 2017.12.21 - Barclays
148. 2017.12.21 - Scotiabank
149. 2018.01.09 - Barclays
150. 2018.01.09 - Bank of America
151. 2018.01.09 - Credit Suisse
152. 2018.01.09 - Scotiabank (1)
153. 2018.01.09 - Scotiabank (2)
154. 2018.01.09 - Societe
155. 2018.01.24 - Societe
156. 2018.01.25 - Scotiabank
157. 2018.01.29 - Barclays
158. 2018.01.30 - Cowen
159. 2018.01.31 - Scotiabank
160. 2018.02.05 - JP Morgan
161. 2018.02.05 - Seaport (1)
162. 2018.02.05 - Seaport (2)
163. 2018.02.12 - Seaport
164. 2018.02.20 - RBC
165. 2018.02.22 - BMO
166. 2018.02.22 - Bank of America (1)
167. 2018.02.22 - Bank of America (2)
168. 2018.02.22 - Cowen
169. 2018.02.22 - Credit Suisse (1)
170. 2018.02.22 - Credit Suisse (2)

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171. 2018.02.22 - Deutsche Bank
172. 2018.02.22 - Evercore
173. 2018.02.22 - Jefferies
174. 2018.02.22 - JP Morgan
175. 2018.02.22 - NatAlliance
176. 2018.02.22 - RBC
177. 2018.02.22 - Scotiabank
178. 2018.02.22 - Societe
179. 2018.02.23 - Scotiabank
180. 2018.02.23 - Seaport
181. 2018.02.23 - Societe
182. 2018.02.26 - MUFG
183. 2018.02.26 - Scotiabank
184. 2018.02.27 - KLR Group
185. 2018.02.27 - Scotiabank
186. 2018.03.04 - RBC
187. 2018.03.06 - UBS
188. 2018.03.12 - JP Morgan
189. 2018.03.14 - Scotiabank
190. 2018.03.16 - Cowen
191. 2018.03.21 - Scotiabank
192. 2018.03.23 - RBC
193. 2018.03.29 - Societe
194. 2018.04.02 - Scotiabank
195. 2018.04.03 - Seaport
196. 2018.04.04 - Scotiabank
197. 2018.04.09 - Evercore

Appendix B – Materials Considered

198. 2018.04.09 - Macquarie
199. 2018.04.16 - Scotiabank
200. 2018.04.25 - Seaport
201. 2018.04.26 - Scotiabank
202. 2018.04.27 - JP Morgan
203. 2018.04.27 - RBC
204. 2018.04.27 - Societe
205. 2018.05.01 - RBC
206. 2018.05.02 - BMO
207. 2018.05.02 - Cowen
208. 2018.05.02 - Jefferies
209. 2018.05.02 - Macquarie
210. 2018.05.02 - RBC
211. 2018.05.02 - UBS
212. 2018.05.03 - Bank of America
213. 2018.05.03 - Credit Suisse
214. 2018.05.03 - Deutsche Bank
215. 2018.05.03 - Evercore
216. 2018.05.03 - JP Morgan
217. 2018.05.03 - NatAlliance
218. 2018.05.03 - Scotiabank (1)
219. 2018.05.03 - Scotiabank (2)
220. 2018.05.03 - Seaport
221. 2018.05.03 - Societe
222. 2018.05.04 - Seaport
223. 2018.05.07 - BMO
224. 2018.05.07 - Seaport

Appendix B – Materials Considered

225. 2018.05.08 - KLR Group
226. 2018.05.08 - RBC
227. 2018.05.14 - RBC
228. 2018.05.18 - UBS
229. 2018.05.21 - MUFG
230. 2018.05.21 - Scotiabank
231. 2018.05.23 - Seaport
232. 2018.05.24 - RBC
233. 2018.05.29 - Societe
234. 2018.06.06 - RBC
235. 2018.06.13 - JP Morgan
236. 2018.06.19 - JP Morgan
237. 2018.06.25 - RBC
238. 2018.06.26 - Scotiabank (1)
239. 2018.06.26 - Scotiabank (2)
240. 2018.06.26 - Societe
241. 2018.07.17 - Seaport (1)
242. 2018.07.17 - Seaport (2)
243. 2018.07.23 - JP Morgan
244. 2018.07.25 - Scotiabank
245. 2018.07.30 - RBC
246. 2018.08.01 - BMO
247. 2018.08.01 - Cowen
248. 2018.08.01 - Jefferies
249. 2018.08.01 - Macquarie
250. 2018.08.01 - RBC
251. 2018.08.02 - Bank of America

Appendix B – Materials Considered

252. 2018.08.02 - Credit Suisse
253. 2018.08.02 - Evercore
254. 2018.08.02 - JP Morgan
255. 2018.08.02 - Morgan Stanley
256. 2018.08.02 - NatAlliance
257. 2018.08.02 - RBC
258. 2018.08.02 - Scotiabank (1)
259. 2018.08.02 - Scotiabank (2)
260. 2018.08.02 - Seaport
261. 2018.08.02 - Societe
262. 2018.08.02 - UBS
263. 2018.08.03 - Seaport
264. 2018.08.07 - MUFG
265. 2018.08.08 - BMO
266. 2018.08.08 - Macquarie
267. 2018.08.08 - RBC
268. 2018.08.09 - Bank of America (1)
269. 2018.08.09 - Bank of America (2)
270. 2018.08.09 - Cowen
271. 2018.08.09 - Evercore
272. 2018.08.09 - NatAlliance
273. 2018.08.09 - Scotiabank (1)
274. 2018.08.09 - Scotiabank (2)
275. 2018.08.09 - Seaport
276. 2018.08.09 - Societe
277. 2018.08.09 - UBS
278. 2018.08.10 - JP Morgan

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279. 2018.08.19 - Evercore
280. 2018.08.20 - JP Morgan
281. 2018.08.21 - Macquarie
282. 2018.08.21 - Societe
283. 2018.08.24 - Scotiabank
284. 2018.08.27 - Macquarie
285. 2018.08.30 - Seaport
286. 2018.09.17 - Stephens (1)
287. 2018.09.17 - Stephens (2)
288. 2018.09.24 - Stephens (1)
289. 2018.09.24 - Stephens (2)
290. 2018.09.27 - Scotiabank
291. 2018.10.08 - Societe
292. 2018.10.12 - MUFG
293. 2018.10.17 - Seaport (1)
294. 2018.10.17 - Seaport (2)
295. 2018.10.17 - Seaport (3)
296. 2018.10.19 - JP Morgan
297. 2018.10.19 - Stephens (1)
298. 2018.10.19 - Stephens (2)
299. 2018.10.24 - Scotiabank
300. 2018.10.31 - BMO
301. 2018.10.31 - Bank of America
302. 2018.10.31 - Jefferies
303. 2018.10.31 - Macquarie
304. 2018.10.31 - RBC
305. 2018.11.01 - Credit Suisse

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306. 2018.11.01 - Evercore
307. 2018.11.01 - JP Morgan
308. 2018.11.01 - NatAlliance
309. 2018.11.01 - Piper Sandler
310. 2018.11.01 - Scotiabank (1)
311. 2018.11.01 - Scotiabank (2)
312. 2018.11.01 - Seaport
313. 2018.11.01 - Societe
314. 2018.11.01 - Stephens
315. 2018.11.01 - UBS
316. 2018.11.02 - Macquarie
317. 2018.11.02 - RBC
318. 2018.11.02 - Stephens (1)
319. 2018.11.02 - Stephens (2)
320. 2018.11.05 - MUFG
321. 2018.11.12 - MUFG
322. 2018.11.13 - Scotiabank
323. 2018.11.15 - Jefferies
324. 2018.11.20 - JP Morgan
325. 2018.11.21 - Evercore
326. 2018.11.29 - Cowen (1)
327. 2018.11.29 - Cowen (2)
328. 2018.12.04 - Macquarie
329. 2018.12.04 - RBC
330. 2018.12.04 - Seaport (1)
331. 2018.12.04 - Seaport (2)
332. 2018.12.04 - Seaport (3)

Appendix B – Materials Considered

333. 2018.12.05 - Seaport
334. 2018.12.05 - Stephens
335. 2018.12.06 - Seaport
336. 2018.12.10 - Seaport
337. 2018.12.18 - Societe
338. 2019.01.15 - Seaport (1)
339. 2019.01.15 - Seaport (2)
340. 2019.01.15 - Seaport (3)
341. 2019.01.16 - Barclays
342. 2019.01.18 - Cowen
343. 2019.01.18 - RBC
344. 2019.01.24 - Credit Suisse
345. 2019.01.24 - Macquarie
346. 2019.01.25 - Cowen
347. 2019.01.25 - Societe
348. 2019.01.29 - MUFG
349. 2019.01.29 - Seaport
350. 2019.01.30 - Barclays
351. 2019.01.30 - RBC
352. 2019.02.07 - Barclays (1)
353. 2019.02.07 - Barclays (2)
354. 2019.02.07 - BMO
355. 2019.02.07 - Cowen
356. 2019.02.07 - Evercore
357. 2019.02.07 - JP Morgan
358. 2019.02.07 - Macquarie
359. 2019.02.07 - Seaport

Appendix B – Materials Considered

360. 2019.02.08 - Bank of America
361. 2019.02.08 - Credit Suisse
362. 2019.02.08 - Morgan Stanley
363. 2019.02.08 - Piper Sandler
364. 2019.02.08 - Scotiabank (1)
365. 2019.02.08 - Scotiabank (2)
366. 2019.02.08 - Seaport
367. 2019.02.08 - Societe
368. 2019.02.08 - Stephens
369. 2019.02.08 - UBS
370. 2019.02.10 - Evercore
371. 2019.02.18 - MUFG
372. 2019.02.20 - Cowen
373. 2019.02.20 - Seaport (1)
374. 2019.02.20 - Seaport (2)
375. 2019.02.25 - Credit Suisse
376. 2019.02.27 - BMO
377. 2019.02.27 - Cowen
378. 2019.02.27 - Jefferies
379. 2019.02.27 - JP Morgan (1)
380. 2019.02.27 - JP Morgan (2)
381. 2019.02.27 - Macquarie
382. 2019.02.27 - RBC
383. 2019.02.27 - Seaport
384. 2019.02.28 - Barclays
385. 2019.02.28 - Bank of America
386. 2019.02.28 - Credit Suisse

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387. 2019.02.28 - Evercore
388. 2019.02.28 - JP Morgan
389. 2019.02.28 - Piper Sandler
390. 2019.02.28 - Scotiabank (1)
391. 2019.02.28 - Scotiabank (2)
392. 2019.02.28 - Seaport
393. 2019.02.28 - Societe
394. 2019.02.28 - Stephens
395. 2019.03.01 - Seaport
396. 2019.03.06 - Barclays
397. 2019.03.06 - MUFG
398. 2019.03.06 - Scotiabank
399. 2019.03.08 - RBC
400. 2019.03.11 - Cowen
401. 2019.03.11 - RBC
402. 2019.03.11 - Stephens
403. 2019.03.19 - Jefferies
404. 2019.03.20 - Societe
405. 2019.03.21 - Evercore
406. 2019.03.21 - Seaport
407. 2019.03.22 - Seaport
408. 2019.03.25 - Evercore
409. 2019.03.27 - Stephens (1)
410. 2019.03.27 - Stephens (2)
411. 2019.04.01 - Evercore
412. 2019.04.05 - BMO
413. 2019.04.09 - Macquarie

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414. 2019.04.10 - RBC
415. 2019.04.10 - Seaport
416. 2019.04.11 - MUFG
417. 2019.04.11 - Seaport (1)
418. 2019.04.11 - Seaport (2)
419. 2019.04.17 - Societe
420. 2019.04.22 - Barclays
421. 2019.04.23 - Macquarie
422. 2019.04.23 - RBC
423. 2019.04.23 - Scotiabank (1)
424. 2019.04.23 - Scotiabank (2)
425. 2019.04.23 - Stephens
426. 2019.04.24 - Seaport
427. 2019.04.26 - Cowen
428. 2019.04.28 - Barclays
429. 2019.04.29 - JP Morgan
430. 2019.04.30 - Scotiabank
431. 2019.05.01 - BMO
432. 2019.05.01 - Bank of America
433. 2019.05.01 - Cowen
434. 2019.05.01 - Jefferies
435. 2019.05.01 - JP Morgan
436. 2019.05.01 - Macquarie
437. 2019.05.01 - Piper Sandler
438. 2019.05.01 - RBC
439. 2019.05.01 - Scotiabank
440. 2019.05.02 - Barclays

Appendix B – Materials Considered

441. 2019.05.02 - Credit Suisse
442. 2019.05.02 - Evercore
443. 2019.05.02 - JP Morgan
444. 2019.05.02 - Macquarie
445. 2019.05.02 - MUFG
446. 2019.05.02 - RBC
447. 2019.05.02 - Seaport (1)
448. 2019.05.02 - Seaport (2)
449. 2019.05.02 - Stephens
450. 2019.05.02 - UBS
451. 2019.05.03 - Seaport
452. 2019.05.13 - Evercore
453. 2019.05.22 - Cowen
454. 2019.05.22 - Credit Suisse
455. 2019.05.23 - Seaport (1)
456. 2019.05.23 - Seaport (2)
457. 2019.05.28 - Barclays
458. 2019.05.30 - Stephens
459. 2019.06.04 - RBC
460. 2019.06.09 - UBS
461. 2019.06.11 - Seaport (1)
462. 2019.06.11 - Seaport (2)
463. 2019.06.11 - Seaport (3)
464. 2019.06.13 - Evercore
465. 2019.06.18 - Scotiabank
466. 2019.06.27 - Piper Sandler
467. 2019.07.09 - Barclays

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468. 2019.07.11 - Wells Fargo
469. 2019.07.12 - JP Morgan
470. 2019.07.18 - Bank of America
471. 2019.07.18 - RBC
472. 2019.07.19 - Cowen
473. 2019.07.19 - Credit Suisse
474. 2019.07.19 - MUFG
475. 2019.07.22 - JP Morgan
476. 2019.07.22 - Seaport
477. 2019.07.31 - Barclays (1)
478. 2019.07.31 - Barclays (2)
479. 2019.07.31 - BMO
480. 2019.07.31 - JP Morgan
481. 2019.07.31 - Macquarie
482. 2019.08.01 - Bank of America
483. 2019.08.01 - Cowen
484. 2019.08.01 - Credit Suisse
485. 2019.08.01 - Evercore
486. 2019.08.01 - Jefferies
487. 2019.08.01 - JP Morgan
488. 2019.08.01 - Piper Sandler
489. 2019.08.01 - Seaport
490. 2019.08.01 - Stephens
491. 2019.08.02 - MUFG
492. 2019.08.05 - RBC
493. 2019.08.05 - UBS
494. 2019.08.12 - Evercore

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495. 2019.08.21 - Cowen
496. 2019.08.22 - Jefferies
497. 2019.08.22 - JP Morgan
498. 2019.09.16 - MKM
499. 2019.09.17 - MKM
500. 2019.09.23 - Truist
501. 2019.09.24 - Truist
502. 2019.09.25 - Credit Suisse
503. 2019.10.07 - Cowen
504. 2019.10.10 - Seaport
505. 2019.10.14 - Evercore
506. 2019.10.14 - JP Morgan
507. 2019.10.16 - RBC
508. 2019.10.17 - Cowen
509. 2019.10.18 - Bank of America
510. 2019.10.21 - Barclays
511. 2019.10.21 - Evercore
512. 2019.10.22 - Bank of America
513. 2019.10.25 - Credit Suisse
514. 2019.10.25 - RBC
515. 2019.10.25 - Truist
516. 2019.10.28 - MUFG
517. 2019.10.29 - Morgan Stanley (1)
518. 2019.10.29 - Morgan Stanley (2)
519. 2019.10.30 - Barclays
520. 2019.10.30 - BMO
521. 2019.10.30 - Cowen

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522. 2019.10.30 - Evercore
523. 2019.10.30 - JP Morgan
524. 2019.10.30 - Piper Sandler
525. 2019.10.30 - RBC
526. 2019.10.30 - Truist
527. 2019.10.31 - Barclays
528. 2019.10.31 - Bank of America
529. 2019.10.31 - Credit Suisse
530. 2019.10.31 - JP Morgan
531. 2019.10.31 - Stephens
532. 2019.10.31 - Truist
533. 2019.10.31 - UBS
534. 2019.11.01 - Credit Suisse
535. 2019.11.04 - MKM
536. 2019.11.06 - JP Morgan
537. 2019.11.25 - Cowen
538. 2019.11.25 - Evercore
539. 2019.12.02 - Barclays
540. 2019.12.02 - Credit Suisse
541. 2019.12.02 - Morgan Stanley
542. 2019.12.02 - RBC (1)
543. 2019.12.02 - RBC (2)
544. 2019.12.02 - Truist
545. 2019.12.03 - Stephens
546. 2019.12.05 - Credit Suisse
547. 2019.12.05 - Stephens
548. 2019.12.06 - Barclays

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549. 2019.12.09 - Bank of America
550. 2019.12.18 - UBS
551. 2019.12.22 - JP Morgan
552. 2019.12.22 - RBC
553. 2019.12.23 - Bank of America
554. 2019.12.23 - Cowen
555. 2019.12.23 - Credit Suisse
556. 2019.12.23 - Piper Sandler
557. 2019.12.23 - RBC
558. 2019.12.23 - Stephens
559. 2019.12.23 - Truist
560. 2019.12.24 - Barclays
561. 2019.12.24 - UBS
562. 2020.01.06 - Bank of America
563. 2020.01.07 - Barclays
564. 2020.01.07 - Bank of America
565. 2020.01.07 - Cowen
566. 2020.01.07 - Credit Suisse
567. 2020.01.07 - Evercore
568. 2020.01.07 - JP Morgan
569. 2020.01.07 - Piper Sandler
570. 2020.01.07 - RBC
571. 2020.01.07 - Stephens
572. 2020.01.07 - Truist
573. 2020.01.07 - UBS
574. 2020.01.08 - Barclays
575. 2020.01.08 - Morgan Stanley

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576. 2020.01.08 - Truist
577. 2020.01.13 - Evercore
578. 2020.01.14 - MKM
579. 2020.01.14 - Susquehanna (1)
580. 2020.01.14 - Susquehanna (2)
581. 2020.01.16 - Cowen
582. 2020.01.21 - Truist
583. 2020.01.22 - JP Morgan
584. 2020.01.23 - RBC
585. 2020.01.23 - Scotiabank
586. 2020.01.24 - Barclays
587. 2020.01.27 - RBC
588. 2020.02.26 - Barclays
589. 2020.02.26 - BMO
590. 2020.02.26 - Bank of America
591. 2020.02.26 - Cowen
592. 2020.02.26 - JP Morgan
593. 2020.02.26 - RBC
594. 2020.02.26 - Scotiabank (1)
595. 2020.02.26 - Scotiabank (2)
596. 2020.02.26 - Truist
597. 2020.02.26 - UBS
598. 2020.02.27 - Credit Suisse
599. 2020.02.27 - Evercore
600. 2020.02.27 - JP Morgan
601. 2020.02.27 - Piper Sandler
602. 2020.02.27 - Stephens

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603. 2020.02.27 - Truist
604. 2020.02.28 - Credit Suisse
605. 2020.02.28 - Scotiabank
606. 2020.02.28 - Susquehanna
607. 2020.03.02 - JP Morgan
608. 2020.03.02 - MKM
609. 2020.03.03 - RBC
610. 2020.03.03 - Stephens
611. 2020.03.05 - Evercore
612. 2020.03.08 - Truist
613. 2020.03.09 - RBC
614. 2020.03.10 - BMO
615. 2020.03.11 - Cowen
616. 2020.03.11 - Susquehanna
617. 2020.03.12 - Cowen
618. 2020.03.12 - Credit Suisse
619. 2020.03.12 - RBC
620. 2020.03.12 - Stephens (1)
621. 2020.03.12 - Stephens (2)
622. 2020.03.12 - Truist
623. 2020.03.13 - Bank of America
624. 2020.03.16 - BMO
625. 2020.03.16 - Susquehanna
626. 2020.03.19 - Cowen
627. 2020.03.23 - Evercore
628. 2020.03.24 - Barclays
629. 2020.03.25 - Cowen

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630. 2020.03.25 - JP Morgan
631. 2020.03.27 - Truist
632. 2020.03.30 - Evercore
633. 2020.03.30 - JP Morgan
634. 2020.04.01 - UBS
635. 2020.04.29 - Cowen
636. 2020.05.07 - Credit Suisse
637. 2020.07.15 - Cowen
638. 2020.07.15 - Credit Suisse
639. 2020.07.30 - Credit Suisse
640. 2021.10.15 - Cowen
641. 2021.10.21 - RBC
642. 2021.10.22 - Bank of America
643. 2022.01.19 - Cowen
644. 2022.01.25 - Truist
645. 2022.03.14 - RBC
646. 2022.04.26 - Cowen
647. 2022.05.05 - Scotiabank
648. 2022.06.08 - RBC
649. 2022.07.14 - RBC
650. 2022.07.27 - Cowen
651. 2022.08.03 - Cowen
652. 2022.08.03 - Evercore
653. 2022.11.07 - JP Morgan

<u>Analyst reports and SEC Filings on other E&P Companies, including</u>

1. 2017.06.01 – Credit Suisse on Cimarex
2. Cimarex FY20 Form 10-K, filed February 23, 2021

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3. Cimarex Form 8-K, filed October 1, 2021

News stories on Apache, other E&P companies, and the oil and gas industry from Factiva, Google, and Bloomberg, including

1. "What are natural gas liquids and how are they used?" *U.S. Energy Information Administration*, April 20, 2012
2. "High value of liquids drives U.S. producers to target wet natural gas resources," *U.S. Energy Information Administration*, May 8, 2014
3. Waha Hub gas prices hit negative territory as Permian pipe restricts flow*," S&P Global Market Intelligence*, March 22, 2019
4. "Apache Corporation Announces Temporary Deferral of Alpine High Natural Gas Production in Response to Recent Pricing at Waha Hub," *Globe Newswire*, April 23, 2019
5. "Apache Corporation Announces Second-Quarter 2019 Financial and Operational Results," *GlobeNewswire*, July 31, 2019
6. "Apache: SVP of Worldwide Exploration Steven Keenan Resigned," *Bloomberg,* October 25, 2019
7. "Apache Executive's Departure Sparks Worst Rout Since 2016," *Bloomberg*, October 25, 2019
8. "OPEC Proposes a Large Cut in Oil Output," *The New York Times*, March 5, 2020
9. "OPEC+ fails to agree on massive supply cut, sending crude prices to 2017 lows," *CNBC*, March 6, 2020
10. "Oil nose-dives as Saudi Arabia and Russia set off 'scorched earth' price war," *CNBC*, March 9, 2020
11. "Why oil prices are crashing and what it means," *CNN*, March 9, 2020
12. "WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020," *World Health Organization*, March 11, 2020
13. "Apache Corporation Announces Revised Capital Guidance and Dividend Reduction," *GlobeNewswire*, March 12, 2020.
14. "Dow Jones Today, Bear Market Worsens On Trump Response To Coronavirus Pandemic; Boeing Shares Collapse," *Investor's Business Daily*, March 12, 2020
15. "After a Long Fall in Oil Prices, a Crash," *The Wall Street Journal Online*, March 15, 2020
16. "The Oil Price Crash Puts Apache Corporation In A Tough Spot," *Seeking Alpha*, March 16, 2020
17. "The Coronavirus Crash Of 2020, And The Investing Lesson It Taught Us," *Forbes*, February 11, 2021

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18. "APA Corporation Closes Two Transactions; Receives $1 Billion of Proceeds," *GlobeNewswire*, March 14, 2022

19. "Waha Hub spot gas' basis spread blows out on PHP maintenance," *S&P Global Commodity Insights*, May 2, 2022

20. "APA Drilling First Pad Since 2019 in Permian's Natural Gas-Rich Alpine High as Prices, Demand Soar," *NGI's All News Access*, November 8, 2022

21. "U.S. Henry Hub natural gas price expected to increase from recent lows," *U.S. Energy Information Administration*, March 26, 2023

22. "Permian Gas Price And Fundamentals," *AEGIS Hedging*, May 19, 2023

23. "Waha Price to Hurt APA Permian Gas Activity: Earnings Outlook," *Bloomberg*, May 5, 2023.

<u>Financial data from Bloomberg, L.P., FactSet Research Systems, Inc., and Federal Reserve Bank of St. Louis ("FRED"), including</u>

1. Price, total return, trading volume, and weights in market and industry indices for Apache

2. Price and total return data for S&P500, S&P Oil & Gas Exploration & Production Select Industry Index, and S&P 500 Oil & Gas Exploration and Production Sub Industry GICS Level 4 Index

3. Data on constituents of S&P 500 Oil & Gas Exploration and Production Sub Industry GICS Level 4 Index

4. Brent Global Crude Oil Spot Price, West Texas Intermediate Crude Oil Spot Price, Natural Gas Liquids Composite Price, Waha Hub Natural Gas Spot Price, and VIX Index data

<u>Documents on Lead Plaintiffs' trading</u>

1. PLYMOUTHCOUNTY_00000014
2. PLYMOUTHCOUNTY_00000098
3. PLYMOUTHCOUNTY_00000106
4. PLYMOUTHCOUNTY_00000114
5. PLYMOUTHCOUNTY_00000122
6. PLYMOUTHCOUNTY_00000130
7. PLYMOUTHCOUNTY_00000138
8. PLYMOUTHCOUNTY_00000146
9. PLYMOUTHCOUNTY_00000154
10. PLYMOUTHCOUNTY_00000162

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11. TEAMSTERS142_00000014
12. TEAMSTERS142_00000108
13. TEAMSTERS142_00000152
14. TEAMSTERS142_00000193
15. TEAMSTERS142_00000276
16. TEAMSTERS142_00000369
17. TEAMSTERS142_00000442
18. TEAMSTERS142_00000014
19. TEAMSTERS142_00000528

<u>Legal decisions on class certification, including</u>

1. *Cammer v. Bloom*, 711 F. Supp. 1264 (D.N.J. 1989)
2. *Greenberg v. Crossroads Sys., Inc.*, 364 F.3d 657 (5th Cir. 2004).
3. *In Re TECO Energy Inc. Securities Litigation*, 2006 U.S. Dist. LEXIS 18101 (M.D. Fla. March 30, 2006)
4. *Barrie v. Intervoice-Brite, Inc.*, 2006 U.S. Dist. LEXIS 69299 (N.D. Tex. Sept. 25, 2006)
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6. *Halliburton II*, 134 S. Ct. 2398 (2014)
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Appendix C – Alleged Misrepresentations Made During the Alleged Class Period

No.	Date	Event	Alleged Misrepresentation from the Complaint
1	9/7/16	Press Release & Barclays Presentation	Press Release - Apache announced that “after more than two years of extensive geologic and geophysical work, methodical acreage accumulation, and strategic testing and delineation drilling, the company can confirm the discovery of a significant new resource play, the ‘Alpine High.’” ¶191 The press release touted Alpine High as an immense oil and wet gas field, holding an estimated “3 billion barrels of oil” and “75 trillion cubic feet (Tcf) of rich gas” in the Barnett and Woodford formations alone, as well as “significant oil potential in the shallower Pennsylvanian, Bone Springs and Wolfcamp formations.” ¶194 Apache made similar statements in an accompanying slide titled “Apache’s Differentiated View” which claimed that the “Perception” in the industry was that Alpine High was “Dry Gas,” whereas the “Reality” was “Wet Gas & Oil.” ¶200 Barclays presentation - Apache highlighted purported “Strong Well Results” and “Successful Oil Tests” from Alpine High. Included on the “Strong Well Results” slide was the Weissmies 1H, for which Apache cited 24-hour initial production (“IP”) rates of 281 barrels of oil per day and 7.1 million cubic feet of gas, and the Ortler 1H, for which Apache reported 24-hour IP rates of 1.7 million cubic feet of gas. The “Successful Oil Tests” slide feature two wells: the Mont Blanc 2H, for which the slide reported an IP rate of 854 barrels of oil per day, and the Redwood 1P, for which the slide reported a rate of 700 barrels of oil per day. ¶202
2	9/21/16	Johnson Rice Energy Conference Presentation	Apache presented slides substantially identical Alpine High Key Highlights” and “Apache Differentiated View” slides described above in 9/7/16. ¶¶204-205
3	9/28/16	Forbes Article	The article noted that “Christmann says the field, which they named Alpine High, contains some of the cheapest oil and gas to produce not just in the U.S., but in the world, economic to drill at prices as low as $40 a barrel[.]” and quoted Defendant Christmann as saying that “Alpine High will be very difficult to compete with on an economic basis.” ¶206

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No.	Date	Event	Alleged Misrepresentation from the Complaint
4	11/3/16	3Q16 Earnings Conference Call	Defendant Christmann highlighted that Alpine High was "an immense resource and a transformational discovery for Apache" that would "drive incremental growth and returns for years to come," and that "[t]he Alpine High is an immense resource and a transformation discovery for Apache." Christmann (CEO) provided investors with a detailed explanation of the "5 distinct target formations" that comprised Alpine High, stating "all of which, we believe, will be highly economic." ¶208 Defendants stated that "[t]wo early tests have demonstrated that these formations [Bone Springs and Wolfcamp] are oil-productive and offer significant potential at Alpine High." ¶208 Defendant Sullivan made similar statements and stated that "[a]s expected in a resource play, Alpine High is becoming more predictable. Every well we've drilled has confirmed our model. . . . We continue to see excellent production performance across this play." ¶209
5	11/18/16	Merrill Lynch Global Energy Conference Presentation	Apache presented slides substantially identical to the "Alpine High Key Highlights" and "Apache Differentiated View" slides described above in 9/7/16. ¶212
6	1/5/17 (after-market)	January Investor Presentation	The presentation slides contained the same materially false or misleading statements made during the 9/7/17 presentation for the Barclays Conference. The presentation also made substantially identical claims to those alleged in 9/7/16 regarding the initial production rates of Redwood 1P, Mont Blanc 2H, Weissmies 1H, and Ortler 1H. ¶214
7	2/14/17	Credit Suisse Energy Summit Presentation	During the conference, Defendant Christmann asserted that the Company had "proven" and "confirmed" that Alpine High was flush with wet gas and oil: "So what have we confirmed? We have a very extensive play fairway, 60 miles. We have 5 geologic formations, each with multiple targets across a 5,000-foot column. We've now proven that we have a segregated hydrocarbon column anywhere from dry gas to oil and

Appendix C – Alleged Misrepresentations Made During the Alleged Class Period

No.	Date	Event	Alleged Misrepresentation from the Complaint
			we have it across this whole area. So all we have to do is put the rock in the right window and you're going to get anywhere from dry gas to wet gas to oil." ¶216 Defendant Christmann confirmed that Alpine High was "a highly economic wet gas play" and emphasized that "Alpine High is just an enormous hydrocarbon system. And we're still just scratching the surface as we work through this. Like most major discoveries, it's getting bigger with more data, which is a big thing and a great thing. We have a highly economic wet gas play … now confirmed across the 55-mile fairway." ¶217 "The nice thing about this … it doesn't take long with the economics on these wells for them to turn. And what I've said in the past is we're not talking hundreds of millions of cubic feet a day, but we're talking multiple B[illion]s ultimately as you move into the future years," adding that "we'll get there quickly." ¶219 Defendant Christmann added "we will get to the oil and we believe there is a lot there, because it's in the system. We validated it. We have a proven column and it's in the right window." ¶220 Apache's slide presentation at the Credit Suisse Energy Summit also repeated the Company's prior claims regarding the initial production statistics at four previously disclosed wells: the Weissmies 1H, the Ortler 1H, the Mont Blanc 2H, and the Redwood 1P, as described further at ¶ 202. ¶ 222
8	2/23/17	4Q16 and FY16 Financial Results Press Release & Earnings Conference Call	Issued a press release, Defendant Christmann was quoted in the press release stating "We [] discovered and announced the Alpine High, a sizeable new resource play in the Delaware Basin, which brings significant drilling inventory and puts Apache in one of the most exciting and competitive positions in the industry." ¶223 Defendants touted for Alpine High stating: "we're not talking hundreds of millions of cubic feet of gas here a day, we're talking multiple Bcfs, a very rich gas, wet

Appendix C – Alleged Misrepresentations Made During the Alleged Class Period

No.	Date	Event	Alleged Misrepresentation from the Complaint
			gas, NGLs, and we think there's going to be also a lot of oil to go with it." ¶224 Defendant Christmann further highlighted that Alpine High contained "3,000 confirmed locations" for wet gas, stating: "we gave you some location counts at Barclays. We've come back now and said we've got a minimum of 3,000 confirmed locations in the wet gas window," emphasizing that "location count has increased significantly since last September." Significantly, Christmann reaffirmed that "even in the lower commodity price environment, this play is going to be very economic." ¶224
9	2/24/17[1]	4Q16 and FY16 Form 10-K	Filed Form 10-K stating "Apache now believes the drilling locations at Alpine High will exceed the 2,000 to 3,000 previously announced." ¶225
10	3/27/17	Scotia Howard Weil 2017 Energy Conference Presentation	Apache presented at Scotia Howard Weil 2017 Energy Conference and presented slides which stated that Apache had confirmed that Alpine High was a "highly economic wet play gas with more than 3000 locations" and that it had "excellent fully-burdened economics," i.e., that it was profitable even when factoring in all infrastructure costs, including both drilling and transport costs. ¶227

[1] The Complaint states that the 2016 Form 10-K was filed on February 23, 2017 (Complaint ¶225); however, according to SEC's website it was filed on February 24, 2018.

Appendix C – Alleged Misrepresentations Made During the Alleged Class Period

No.	Date	Event	Alleged Misrepresentation from the Complaint
11	5/4/17	1Q17 Financial Results Press Release & Earnings Conference Call	Apache issued a press release in which Defendant Christmann is quoted as stating: "At Alpine High, testing and delineation have continued with strong results that reinforce our confidence in this world-class resource play." ¶229 During the earnings conference call, Christmann reiterated claims that the test wells had "proven" Apache's understanding of Alpine High as a "massive hydrocarbon resource," stating: "[t]he performance of our first batch of test wells at Alpine High was on par with or better than longer-lateral, fully optimized wells in analogous shale resource plays, such as the SCOOP and the Marcellus. … Since our original announcement, we have continued to delineate the play. The test wells drilled to date have proven much of what we anticipated for Alpine High." ¶230 Defendant Christmann further asserted that "our progress since the initial announcement, 8 months ago, has been exceptional. To date, we have confirmed a highly economic wet gas play with a minimum of 3,000 locations. The economics of the wet gas portion of Alpine High are greatly enhanced by its oil content and the high-quality NGLs demonstrated in many of our test wells to date." Christmann also reiterated that the test wells he had previously announced had only "confirmed" his bold claims: "When we announced Alpine High, we released data on nine test wells. The results of these wells, coupled with the geologic and reservoir evaluation work completed at that time, confirmed a world-class resource with an estimated 75 Tcf of gas and 3 billion barrels of oil in place in the Woodford and Barnett formations alone." ¶231 Defendant Sullivan similarly touted the results from test wells at Alpine, stating "The result[s] we see in our test wells at Alpine High continue to give us confidence that this will be one of the lowest cost wet gas plays in North America." ¶232 "[t]he results of [their initial test] wells, coupled with the geologic and reservoir evaluation work completed

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No.	Date	Event	Alleged Misrepresentation from the Complaint
			at that time" had "confirmed" their claims about the recoverable oil and gas at Alpine High ¶234 Apache reported findings from two new wells: Chinook 101AH and Blackhawk 5H. Christmann said that Chinook 101AH and Blackhawk 5H had "achieved higher 24-hour oil I[nitial] P[roduction] [rates] and higher oil cuts than any of the wells drilled," and stated that this "further validates our geologic and thermal maturity models, which predicted that the source rock would produce more oil and higher BTU gas at shallower depths." Defendant Sullivan similarly touted these wells, stating that the Chinook 101AH well had "produced at a peak 24-hour rate of approximately . . . 620 barrels of oil," calling it "an excellent result." Sullivan further highlighted that the Blackhawk 5H had "produced at a peak 24-hour rate of 742 barrels of oil." ¶235 Apache released investor presentation slides in which Blackhawk 5H purportedly had the "Highest Oil Yield To Date in Barnett" with a 24-hour initial production rate of 742 barrels per day, and Chinook 101AH purportedly had the "[h]ighest oil yield to date for a Woodford target," with 24-hour initial oil production rate of 620 barrels per day. ¶236
12	5/4/17[2] (after-market)	1Q17 Form 10-Q	Apache reiterated the statements from its press release about Blackhawk 5H and Chinook 101AH wells and that the "drilling test results at Alpine High continue to validate the low-cost, wet gas value of the play.". ¶238

[2] The Complaint states that the 1Q17 Form 10-Q was filed on May 5, 2017 (Complaint ¶238); however, according to SEC's website it was filed on May 4, 2017 after market hours.

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No.	Date	Event	Alleged Misrepresentation from the Complaint
13	5/11/17	Annual Shareholder Meeting	Defendant Christmann highlighted Apache's "significant discovery at Alpine High," stating: "It's a field that will deliver incredible value to Apache and its shareholders for many, many years to come." Christmann further stated that "Alpine High brings to us decades of inventory. It puts Apache in one of the most exciting and competitive positions in the industry. Since our announcement last September, we have continued testing and delineation. We continue to see strong results that reinforce our confidence in this world-class resource play." Apache's accompanying slides also again touted "> 3,000 drilling locations" in the Alpine High. ¶239
14	5/15/17	Societe Generale Presentation	Apache presented slides identical to the press release on 5/4/17 concerning production statistics for Chinook 101AH and Blackhawk 5H. ¶241
15	5/23/17	UBS Global Oil and Gas Conference Presentation	Defendants repeated slides alleged in the press release on 5/4/17 concerning wells including Chinook 101AH and Blackhawk 5H. ¶241
16	8/3/17	2Q17 Financial Results Press Release & Earnings Conference Call	The press release noted that Apache had "[c]ompleted its first appraisal wells in the oil window of the Wolfcamp formation at Alpine High, providing further confirmation of an oil play and supporting hundreds of additional drilling locations." ¶243 Defendant Christmann highlighted Alpine High stating "we continue to be very confident in our more than 3,000 wet gas well location count, which remains highly economic at current or even lower prices." During the call, Christmann also touted "hundreds of locations in the Wolfcamp so that will be oil locations." ¶244
17	10/9/17 (after-market)	Alpine High Update Call and Web Presentation	Apache posted a pre-recorded update call in which Defendant Christmann highlighted the economic prospects at Alpine High, stating: "We have an extremely large wet gas play with over 3,500 highly economic locations," adding that "The economics of this play are driven by the low cost and the tremendous volumes of oil and NGLs." ¶247

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No.	Date	Event	Alleged Misrepresentation from the Complaint
			Defendant Sullivan similarly stated that the Alpine High was "three separate hydrocarbon plays: an extremely large and highly economic wet gas play, a smaller but also economically compelling dry gas play, and an emerging oil play." ¶248 Sullivan also specifically claimed that there were "455 million barrels" of recoverable oil across the entire Alpine High play: "The weighted average typical Alpine High wet gas well is estimated to produce 13.3 Bcfe of hydrocarbons, of which 6% is oil. The recoverable oil volume is 130,000 barrels per well and 455 million barrels of oil for the entire project based on 3,500 wet gas locations. This would yield a 13.4 [%] recovery factor on the 3 billion barrels of stated original oil in place." ¶248 Sullivan also again touted Alpine High's numerous oil drilling locations, stating that, in the Wolfcamp and Bone Springs formations, "[Apache] can safely say that we have at least 500 economic [oil] well locations at this time." Additionally, the slides accompanying the call repeatedly touted a newly increased "Current Location Count of 5,000+." ¶248 Defendants also introduced new highly specific claims about the economics of a "typical well" in the "wet gas play" at Alpine High, and how highly profitable this "typical well" (which it also called a "midrange well") would be, as these wells would produce anywhere from 9 BCFE to 15 BCFE of hydrocarbons, including substantial amounts of both wet gas and oil. ¶250
18	11/2/17	3Q17 Earnings Conference Call	Defendant Christmann insisted that that it would be "less than two years" before cash flow at the play would be equal to or exceed costs: "if we just take a single rig at Alpine High, it's less than 2 years before it's self-funding…And that's fully burdened with infrastructure and midstream spend." ¶252
19	2/22/18	4Q17 and FY17 Earnings Conference Call	Apache held an investor conference call during which Defendant Christmann reiterated his bold claims about Alpine High and its transformational nature for Apache, stating: "[A]t Alpine High, we are building out a world-class resource play that will change the

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No.	Date	Event	Alleged Misrepresentation from the Complaint
			course of Apache. The expanse of the opportunity in terms of acreage and hydrocarbon column will drive capital investment, and very soon, free cash flow for decades to come." Christmann touted Apache's expected near future production and growth rate at Alpine High, stating that "[b]y 2020, average daily production is expected to be between 160,000 and 180,000 BOEs a day, which represents a compound annual growth rate in excess of 150%." ¶254 Defendants assured reassured investors that Alpine High would be profitable and successful even at extremely low commodity prices. For example, Christmann stated that "[i]n the context of today's commodity price, we acknowledge that funding a wet gas play is a bit contrarian, but it is justified by the long-term scale and return potential even at lower gas prices." Similarly, in response to an analyst question seeking further reassurances as to whether Apache had "looked at …some of the downside cases" involving low gas prices Defendant Christmann unequivocally assured investors that there was nothing to worry about, because Alpine High "is going to really hum below $2 [prices] on the gas side [,]" and "we've run many cases on the downside. We would not be making this type of investment on the midstream or the upstream side if we thought there was a sensitivity that was close to anything that would come into making it not work under very, very low gas and NGL and oil prices." ¶256
20	2/22/18[3] (after-market)	4Q17 and FY17 Form 10-K	Apache filed a Form 10-K stating "Apache has identified over 3,500 economic drilling locations in a wet gas play and over 1,000 locations in a dry gas play at Alpine High. The Company is also working to delineate an emerging oil play at Alpine High, with at least 500 locations already identified." ¶258 Form 10-K also stated that "Combined with multi-well pad drilling and revenue uplift expected from oil and NGLs present in the wet gas play, Alpine High is

[3] The Complaint states that the 2017 Form 10-K was filed on February 23, 2018 (Complaint ¶258); however, according to SEC's website, it was filed on February 22, 2018 after market hours.

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No.	Date	Event	Alleged Misrepresentation from the Complaint
			anticipated to generate strong cash margins and a competitive recycle ratio [a measure of profitability per unit of oil or gas] when compared to other Permian operations." ¶258
21	2/26/18	DUG Executive Conference Presentation	Apache again touted its purported "5,000+ locations identified to date," "highly economic wet gas play," and "proven oil upside" at Alpine High. ¶259
22	3/26/18	March/April Investor Presentation	Apache made an identical statement as in the DUG conference. ¶259
23	5/3/18	1Q18 Earnings Conference Call	Apache held an investor conference call where Defendant Christmann assured "there's a lot of proven oil, we've shown that." ¶261 Defendant Christmann stated that "in terms of drilling inventory, recall that we increased our risked location count to more than 5,000 locations at our October webcast update." Christmann also told investors that, "we are confident that as field delineation and development progresses, the risk[ed] location count [i.e., number of economic well sites] will increase substantially over the next several years." ¶262
24	5/30/18	Annual Bernstein Strategic Decisions Conference Presentation	Apache reiterated that it had "5,000+ locations identified to date," a "highly economic wet gas play," and "proven oil upside," at Alpine High. ¶263
25	6/5/18	June Marketing Presentation	Apache made an identical statement as the one made 5/30/18 reiterating that it has "5000+ locations identified to date" a "highly economic wet gas play," and "proven oil upside," at Alpine High. ¶263
26	8/2/18	2Q18 Earnings Conference Call	Apache held an investor conference call during which Defendant Christmann reiterated Apache's claims of more than 5,000 viable drilling locations identified at Alpine High: "in terms of drilling inventory, our location count today stands at more than 5,000 wells," and further told investors that this count would only

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No.	Date	Event	Alleged Misrepresentation from the Complaint
			increase, stating that "[l]anding zone and spacing tests thus far have confirmed that this inventory count is conservative, based on original assumptions." ¶265
27	8/8/18 (after-market)	Conference call with investors and analysts	Apache held an investor conference call during which Defendant Christmann assured investors that "Alpine High is on a tremendous growth path," and reaffirmed Defendants' claims, made from the outset of the Class Period, that the play contained an "estimated resource in place of 75 Tcf of gas and 3 billion barrels of oil in just 2 of the 5 proven hydrocarbon-bearing formations," and "more than 5,000 identified drilling locations." ¶266
28	9/21/18	CEO interview on Bloomberg Commodities Edge	Defendant Christmann discussed Alpine High stating that "[t]here is a very large wet gas play and there will be a lot of rich gas but there will also be a lot of oil," and that, "[w]e've proven there's oil … a lot of rich gas." ¶267
29	2/28/19 (after-market)	4Q18 and FY18 Form 10-K	Apache filed 2018 Form 10-K which reiterated past claims about Alpine High location counts, stating that "Apache has identified over 3,500 economic drilling locations in a wet gas play and over 1,000 locations in a dry gas play at Alpine High." Additionally, the 2018 10-K highlighted the purported 96% "success rate" Apache had experienced in drilling wells at Alpine High (meaning purportedly only 4% of wells had failed to produce meaningful quantities of oil or gas). ¶270
30	5/1/19[4] (after-market)	1Q19 Financial Results Press Release	Apache issued a press release in which Apache stated that "In the Permian, we are poised to deliver attractive oil growth and a substantial cash flow uplift at Alpine High in the second half of the year." ¶273
31	5/2/19	1Q19 Earnings Conference Call	During the earnings call, Defendant Christmann assured that Apache was having success by spacing its wells further out on certain well pads, meaning fewer wells per pad. Christmann also assured that that Apache's drilling location count not only would not be

[4] The Complaint states that the press release was issued on May 2, 2019 (Complaint ¶273); however, according to a GlobeNewswire article dated May 1, 2019, the press release was issued on May 1, 2019 after market hours.

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No.	Date	Event	Alleged Misrepresentation from the Complaint
			reduced, but would likely *increase*, stating that "the last location count we put out was fall of '17, I think, October of '17. And we're still in a position where location count would go up given the assumptions we've got in place," and adding "we're very confident in those numbers. And you're strong performance.'" ¶274
32	5/14/19[5]	Bloomberg story quoting Apache spokesperson	Bloomberg published a story titled "Apache bets big on Permian gas liquids". An Apache corporate spokesperson was quoted in the article as stating "Investors do not yet have an appreciation for the potential cash flow generation from the liquids play at Alpine High," and that "[e]valuation of the oil play at Alpine High will continue to evolve, but our view of 3 billion bbl of associated oil in place in just the Woodford and Barnett remains unchanged." ¶275
33	7/31/19[6] (after-market)	2Q19 Financial Results Press Release	Apache issued a press release noting that Alpine High's production has been disappointing, purportedly due to "delays" in bringing wells online, but assured investors that it would catch up in the second half of 2019 and meet its oil production plan as well. Specifically, Defendant Christmann was quoted as saying: "We will catch up in the second half of 2019 and exit the year with oil production on plan and with strong momentum heading into 2020." ¶278
34	8/1/19	2Q19 Earnings Conference Call	In its earnings call, Defendant Christmann stated "we like the asset [referring to Alpine High]. It's a large resource as we've proven. There is tremendous rich-gas potential." ¶279

[5] The Complaint states that the Bloomberg story was published on May 15, 2019 (Complaint ¶275); however, according to Bloomberg, it was published on May 14, 2019.

[6] The Complaint states that the press release was issued on August 1, 2019 (Complaint ¶278); however, according to a GlobeNewswire article dated July 31, 2019, the press release was issued on July 31, 2019 after market hours.